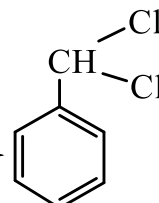
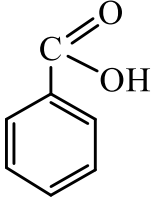
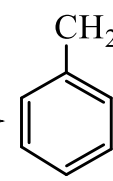
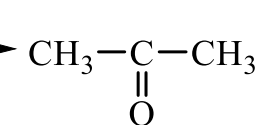
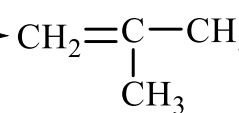
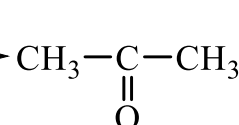


Задание 33 ЕГЭ по химии

Формулировка задания: «Напишите уравнения реакций, с помощью которых можно осуществить следующие превращения. При написании уравнений реакций используйте структурные формулы органических веществ.»

2017

<p>1.</p>	<p>бензол $\xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3}$ X_1 \rightarrow  $\xrightarrow{\text{KOH(водн.)}, t^\circ}$ $X_2 \rightarrow$</p> <p>$\xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4, t^\circ}$  $\xrightarrow{\text{CH}_3\text{OH}, \text{H}_2\text{SO}_4(\text{конц.}), t^\circ}$ X_3</p>
<p>2.</p>	<p>гептан \rightarrow толуол $\xrightarrow{\text{Cl}_2, h\nu}$ X_1 $\xrightarrow{\text{KOH(водн.)}, t^\circ}$  $\xrightarrow{\text{CuO}, t^\circ}$</p> <p>$\rightarrow X_2 \xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}, t^\circ} X_3$</p>
<p>3.</p>	<p>$\text{CH}_4 \rightarrow \text{HC}\equiv\text{CH} \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}}$ $X_1 \xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}, t^\circ}$ $X_2 \rightarrow$</p> <p>$\xrightarrow{\text{Ca}(\text{OH})_2, t^\circ}$ $X_3 \xrightarrow{t^\circ}$ </p>
<p>4.</p>	<p>бутан $\xrightarrow{\text{AlCl}_3, t^\circ}$ $X_1 \xrightarrow{\text{Br}_2, h\nu}$ $X_2 \xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$  \rightarrow</p> <p>$\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$  $\xrightarrow{\text{H}_2, \text{Ni}}$ X_3</p>

Задание 33 ЕГЭ по химии

<p>5.</p>	<p> <chem>CC1CCCCC1</chem> $\xrightarrow{\text{Pt}, t^\circ}$ X_1 $\xrightarrow{\text{KMnO}_4 \text{ (водн. р-р)}, t^\circ}$ <chem>CC(=O)Oc1ccccc1</chem> \rightarrow бензол $\xrightarrow{\text{HNO}_3, \text{H}_2\text{SO}_4, t^\circ}$ X_2 $\xrightarrow{\text{Zn}, \text{HCl}}$ X_3 </p>
<p>6.</p>	<p> формальдегид $\xrightarrow{\text{H}_2, \text{Ni}}$ X_1 $\xrightarrow{\text{HCl}}$ X_2 \rightarrow <chem>Cc1ccccc1</chem> $\xrightarrow{\text{HNO}_3, \text{H}_2\text{SO}_4, t^\circ}$ X_3 $\xrightarrow{\text{Fe}, \text{HCl}}$ <chem>Cc1ccc(N)cc1.[Cl-]</chem> </p>
<p>7.</p>	<p> ацетилен $\xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}}$ X_1 $\xrightarrow[\text{H}_2\text{SO}_4]{\text{K}_2\text{Cr}_2\text{O}_7}$ X_2 $\xrightarrow{\text{CaO}}$ X_3 $\xrightarrow{t^\circ}$ ацетон $\xrightarrow{\text{H}_2, \text{Ni}}$ X_4 </p>
<p>8.</p>	<p> 1,2-дибромэтан \rightarrow ацетилен $\xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}}$ X_1 $\xrightarrow[\text{H}_2\text{SO}_4]{\text{K}_2\text{Cr}_2\text{O}_7}$ X_2 $\xrightarrow{\text{Ca}(\text{HCO}_3)_2}$ X_3 $\xrightarrow{t^\circ}$ ацетон </p>
<p>9.</p>	<p> гексан \rightarrow бензол $\xrightarrow[\text{H}_3\text{PO}_4]{\text{CH}_2=\text{CH}_2}$ X_1 $\xrightarrow{\text{Cl}_2, h\nu}$ X_2 \rightarrow <chem>CC(O)c1ccccc1</chem> $\xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4}$ X_3 </p>
<p>10.</p>	<p> этилбензол $\xrightarrow{\text{Cl}_2, h\nu}$ X_1 $\xrightarrow{\text{NaOH}_{(\text{спирт.})}}$ X_2 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ <chem>CC(=O)Oc1ccccc1</chem> $\xrightarrow{\text{NaHCO}_3}$ X_3 $\xrightarrow[\text{сплавление}]{\text{NaOH}_{(\text{тв.})}}$ X_4 </p>

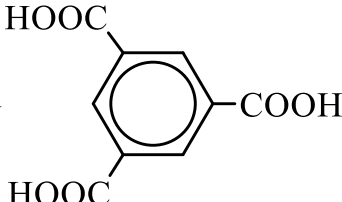
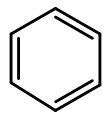
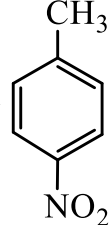
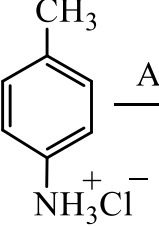
Задание 33 ЕГЭ по химии

11.	<p> $\text{метилацетат} \xrightarrow{\text{Ca(OH)}_2, \text{H}_2\text{O}, t^\circ} \text{X}_1 \xrightarrow{t^\circ} \text{X}_2 \longrightarrow$ $\longrightarrow \text{пропанол-2} \xrightarrow[180^\circ \text{C}]{\text{H}_2\text{SO}_{4(\text{конц.})}} \text{X}_3 \longrightarrow \text{пропандиол-1,2}$ </p>
12.	<p> $\text{C}_6\text{H}_5\text{-COOH} \longrightarrow \text{X}_1 \xrightarrow{\text{NaOH}, t^\circ} \text{C}_6\text{H}_6 \xrightarrow[\text{H}_3\text{PO}_4]{\text{CH}_3\text{CH}=\text{CH}_2} \longrightarrow$ $\longrightarrow \text{X}_2 \xrightarrow{\text{Cl}_2, h\nu} \text{C}_6\text{H}_5\text{-C(CH}_3)_2\text{Cl} \xrightarrow[\text{H}_2\text{O}]{\text{NaOH}} \text{X}_3$ </p>
13.	<p> $\text{пропаналь} \xrightarrow{\text{H}_2, \text{Pt}} \text{X}_1 \xrightarrow[180^\circ \text{C}]{\text{H}_2\text{SO}_{4(\text{конц.})}} \text{X}_2 \longrightarrow \text{пропандиол-1,2} \xrightarrow{\text{изб. HBr}} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{изб. KOH}_{(\text{спирт.})}, t^\circ} \text{X}_4$ </p>
14.	<p> $\text{бутадиен-1,3} \xrightarrow{1 \text{ моль H}_2, \text{кат.}} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{CH}_3\text{COOH} \xrightarrow{\text{Cl}_2, \text{P}_{\text{красн.}}} \longrightarrow$ $\longrightarrow \text{X}_2 \longrightarrow \text{глицин} \xrightarrow{\text{Ba(OH)}_2} \text{X}_3$ </p>
15.	<p> $\text{бромэтан} \xrightarrow{\text{KOH}, \text{H}_2\text{O}, t^\circ} \text{X}_1 \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4} \text{этаналь} \longrightarrow \text{X}_1 \longrightarrow$ $\longrightarrow \text{дивинил} \xrightarrow{\text{изб. Br}_2} \text{X}_2$ </p>
16.	<p> $\text{X}_1 \xrightarrow{\text{Zn}} \text{циклопропан} \xrightarrow{\text{HBr}, t^\circ} \text{X}_2 \longrightarrow \text{пропен} \longrightarrow$ $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_3 \xrightarrow{\text{CaCO}_3} \text{X}_4$ </p>
17.	<p> $\text{метан} \longrightarrow \text{X}_1 \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_2 \longrightarrow \text{C}_6\text{H}_5\text{CH}_3 \longrightarrow$ $\longrightarrow \text{бензоат калия} \xrightarrow{\text{KOH}, t^\circ} \text{X}_2$ </p>

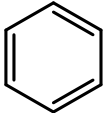
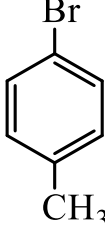
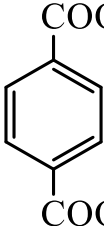
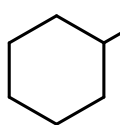
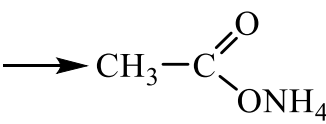
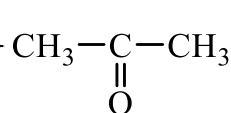
Задание 33 ЕГЭ по химии

18.	<p> $\text{метилацетат} \xrightarrow{\text{Ca(OH)}_2, \text{H}_2\text{O}, t^\circ} \text{X}_1 \xrightarrow{t^\circ} \text{ацетон} \xrightarrow{\text{H}_2} \text{X}_2 \xrightarrow{\text{H}_2\text{SO}_4, 180^\circ\text{C}} \text{X}_3$ $\text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}} \text{пропандиол-1,2}$ </p>
19.	<p> $\text{CH}_3\text{-CH}_2\text{-OH} \xrightarrow[180^\circ\text{C}]{\text{H}_2\text{SO}_4 \text{ (конц.)}} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}} \text{X}_2 \xrightarrow{\text{изб. HBr}} \text{X}_3 \xrightarrow{\text{изб. [Ag(NH}_3)_2\text{]OH}} \text{этин} \xrightarrow{\text{этин}} \text{X}_4$ </p>
20.	<p> $\text{CH}_4 \rightarrow \text{C}_2\text{H}_2 \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_1 \xrightarrow{\text{CH}_3\text{Cl, AlCl}_3} \text{X}_2 \xrightarrow{\text{KOH, сплавл.}} \text{бензоат калия} \xrightarrow{\text{бензоат калия}} \text{X}_1$ </p>
21.	<p> $\text{этилбензол} \xrightarrow[\text{H}_2\text{SO}_4]{\text{KMnO}_4} \text{X}_1 \xrightarrow{\text{KOH}} \text{X}_2 \rightarrow \text{бензол} \xrightarrow{\text{HNO}_3} \text{X}_3 \xrightarrow{\text{Fe, HCl}} \text{X}_4$ </p>
22.	<p> $\text{CH}_3\text{CHO} \xrightarrow{\text{KMnO}_4, \text{KOH}} \text{X}_1 \xrightarrow[\text{H}_2\text{O}]{\text{электролиз}} \text{X}_2 \xrightarrow{\text{Cl}_2, h\nu} \text{X}_3 \xrightarrow{\text{KOH (спирт. р-р), } t^\circ} \text{хлорэтан} \xrightarrow{\text{хлорэтан}} \text{X}_3 \rightarrow \text{1,2-дибромэтан}$ </p>
23.	<p> $\text{гексан} \xrightarrow{\text{Pt}, t^\circ} \text{X}_1 \xrightarrow{\text{CH}_2=\text{CH}_2, \text{H}^+} \text{X}_2 \xrightarrow{\text{Cl}_2, h\nu} \text{X}_3 \xrightarrow[\text{KOH (водн. р-р)}]{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4} \text{X}_4$ $\text{X}_3 \rightarrow \text{1-хлорпропан} \xrightarrow{\text{KOH (водн. р-р)}} \text{X}_4$ </p>
24.	<p> $\text{ацетилен} \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_1 \rightarrow \text{бензол} \xrightarrow{\text{Cl}_2, h\nu} \text{X}_2 \xrightarrow{\text{KOH (водн. р-р)}} \text{X}_3 \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4, t^\circ} \text{бензойная кислота}$ </p>

Задание 33 ЕГЭ по химии

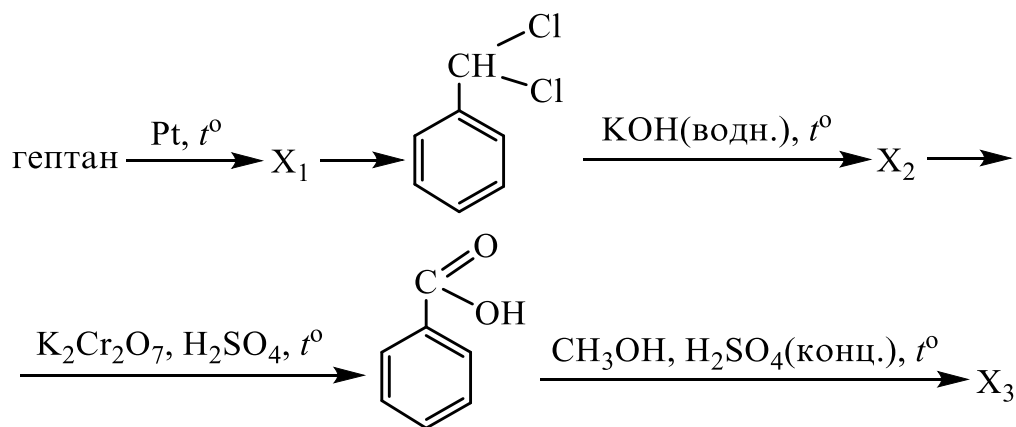
25.	<p>этан $\xrightarrow{\text{Cl}_2, h\nu}$ X_1 \longrightarrow бутан $\xrightarrow{1 \text{ моль Br}_2, \text{ свет}}$ X_2 \longrightarrow</p> <p>\longrightarrow бутен-2 $\xrightarrow{\text{KMnO}_4, \text{ H}_2\text{SO}_4, t^\circ}$ X_3</p>
26.	<p>пропан $\xrightarrow{\text{Pt}, t^\circ}$ X_1 \longrightarrow 1,2-дибромпропан $\xrightarrow{\text{NaOH(спирт. р-р)}}$</p> <p>$\longrightarrow$ X_2 $\xrightarrow{t^\circ, \text{ кат.}}$ X_3 $\xrightarrow{\text{KMnO}_4, \text{ H}_2\text{SO}_4, t^\circ}$ </p>
27.	<p>пропан $\xrightarrow{\text{Pt}, t^\circ}$ X_1 $\xrightarrow{\text{Br}_2}$ X_2 $\xrightarrow{\text{Zn}}$ X_1 \longrightarrow</p> <p>\longrightarrow пропанол-2 $\xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{ H}_2\text{SO}_4}$ X_3</p>
28.	<p>$\text{CaC}_2 \xrightarrow{\text{H}_2\text{O}}$ X_1 $\xrightarrow{\text{H}_2\text{O}, \text{ Hg}^{2+}}$ X_2 $\xrightarrow{\text{KMnO}_4, \text{ H}_2\text{SO}_4}$ CH_3COOH \longrightarrow</p> <p>\longrightarrow X_3 \longrightarrow CH_4</p>
29.	<p>пропанол-1 \longrightarrow пропен $\xrightarrow{\text{KMnO}_4, \text{ H}_2\text{O}, 0^\circ\text{C}}$ X_1 $\xrightarrow{\text{изб. HBr}}$ X_2 \longrightarrow</p> <p>$\xrightarrow{\text{изб. KOH (спирт. р-р), } t^\circ}$ X_3 $\xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}}$ X_4</p>
30.	<p> $\xrightarrow{\text{Cl}_2, \text{ AlCl}_3}$ X_1 $\xrightarrow{\text{CH}_3\text{Cl}, \text{ Na}}$ X_2 \longrightarrow </p> <p>\longrightarrow  $\xrightarrow{\text{AgNO}_3}$ X_3</p>

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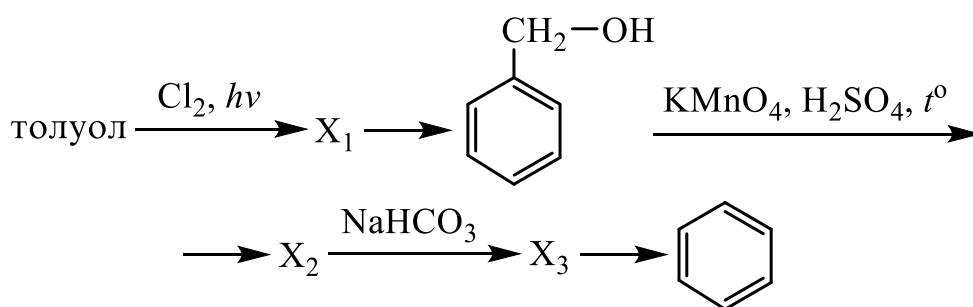
31.	<p>1,1-дибромпропан $\xrightarrow{2\text{NaOH}, \text{H}_2\text{O}}$ X_1 $\xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4}$ \rightarrow</p> <p>\rightarrow пропановая кислота $\xrightarrow{\text{Cl}_2, \text{P}_{\text{красн.}}}$ X_2 $\xrightarrow{\text{NaHCO}_3}$ X_3 $\xrightarrow{\text{CH}_3\text{-CH}_2\text{-I}}$ X_4</p>
32.	<p> $\xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3}$ X_1 \rightarrow  $\xrightarrow{\text{CH}_3\text{Br}, \text{Na}}$ X_2 \rightarrow</p> <p>\rightarrow  $\xrightarrow{2\text{CH}_3\text{CH}_2\text{OH}, \text{H}_2\text{SO}_4, t^\circ}$ X_3</p>
33.	<p>бензол \rightarrow циклогексан $\xrightarrow{\text{Cl}_2, h\nu}$ X_1 $\xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$ X_2 \rightarrow</p> <p>\rightarrow  $\xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4}$ X_3</p>
34.	<p>1,2-дибромэтан $\xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$ X_1 $\xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}}$ X_2 $\xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}, t^\circ}$ \rightarrow</p> <p>\rightarrow  $\xrightarrow{\text{Ba}(\text{OH})_2, t^\circ}$ X_3 $\xrightarrow{t^\circ}$ </p>
35.	<p>$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH} \rightarrow X_1 \rightarrow \text{C}_6\text{H}_{14} \xrightarrow{t^\circ, \text{кат.}} X_2 \rightarrow$</p> <p>$\rightarrow \text{C}_6\text{H}_5\text{CH}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} X_3$</p>

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36.

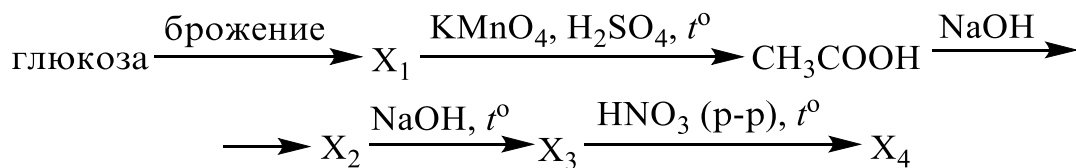


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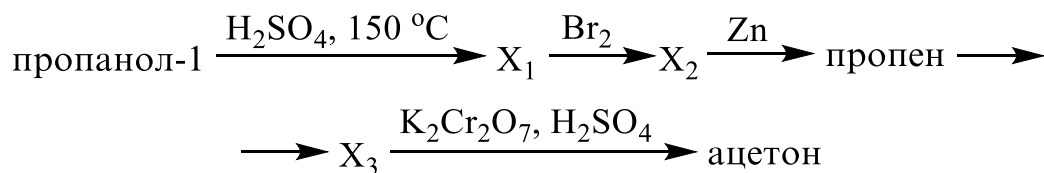


2016

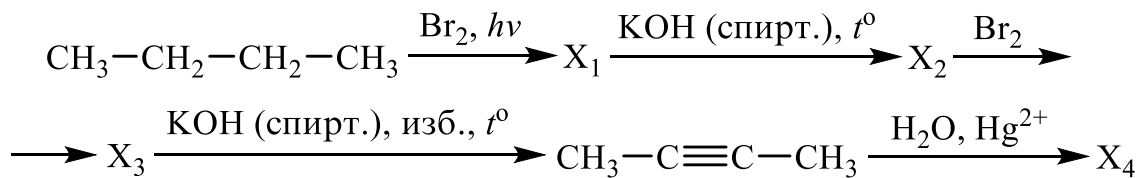
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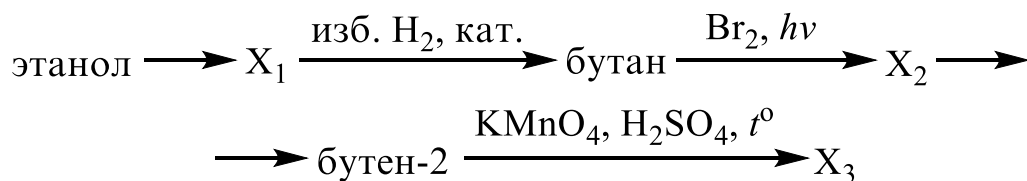
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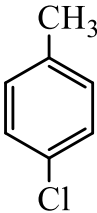
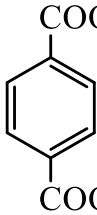
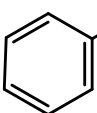
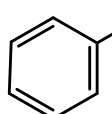
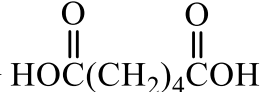
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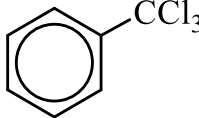
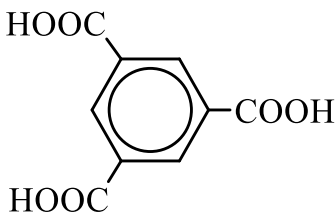
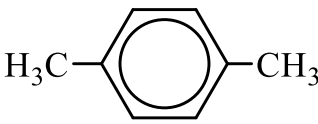
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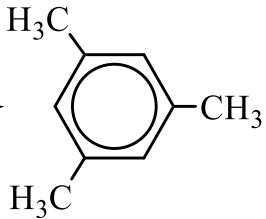
Задание 33 ЕГЭ по химии

42.	<p>гептан $\xrightarrow{\text{Pt}, t^\circ}$ X_1 $\xrightarrow{\text{Cl}_2, \text{AlCl}_3}$  $\xrightarrow{\text{CH}_3\text{Cl}, \text{Na}}$ X_2 \longrightarrow</p> <p>\longrightarrow  $\xrightarrow{2\text{CH}_3\text{OH}, \text{H}_2\text{SO}_4, t^\circ}$ X_3</p>
43.	<p> $\xrightarrow{\text{Cl}_2, h\nu}$ X_1 $\xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$ X_2 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ \longrightarrow</p> <p>\longrightarrow  $\xrightarrow{2\text{HBr}}$ X_3 $\xrightarrow{\text{Zn}, t^\circ}$ X_2</p>
44.	<p>$\text{C}_2\text{H}_4 \longrightarrow$ этиленгликоль $\xrightarrow{\text{изб. HBr}}$ X_1 $\xrightarrow{\text{изб. KOH (спирт.)}, t^\circ}$ \longrightarrow</p> <p>\longrightarrow $X_2 \longrightarrow$ $\text{CH}_3\text{CHO} \xrightarrow{\text{Cu(OH)}_2}$ X_3</p>
45.	<p>бутанон $\xrightarrow[t^\circ]{\text{H}_2, \text{кат.}}$ X_1 $\xrightarrow[180^\circ\text{C}]{\text{H}_2\text{SO}_4(\text{конц.})}$ X_2 $\xrightarrow[t^\circ]{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ $X_3 \longrightarrow$</p> <p>\longrightarrow ацетат натрия $\xrightarrow[t^\circ]{\text{NaOH (тв.)}}$ X_4</p>
46.	<p>бензол $\xrightarrow{\text{H}_2, \text{Pt}}$ X_1 $\xrightarrow{\text{Cl}_2, h\nu}$ $X_2 \longrightarrow$ циклогексанол $\xrightarrow[160^\circ\text{C}]{\text{H}_2\text{SO}_4(\text{конц.})}$ \longrightarrow</p> <p>\longrightarrow $X_3 \longrightarrow$ </p>
47.	<p>$\text{CH}_3\text{COONa} \longrightarrow \text{CH}_4 \longrightarrow X_1 \longrightarrow \text{C}_6\text{H}_6 \longrightarrow$</p> <p>$\longrightarrow X_2 \xrightarrow{\text{KMnO}_4, \text{KOH}, t^\circ} \text{C}_6\text{H}_5\text{COOK}$</p>
48.	<p>$\text{CH}_3\text{COOCH}_3 \longrightarrow (\text{CH}_3\text{COO})_2\text{Ca} \xrightarrow{t^\circ} X_1 \xrightarrow{\text{H}_2, \text{кат.}}$ $X_2 \longrightarrow$</p> <p>$\longrightarrow \text{C}_3\text{H}_6 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X_3</p>


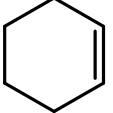
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<p>49.</p>	<p>ацетилен $\xrightarrow{C \text{ акт.}, t^{\circ}}$ $X_1 \xrightarrow{CH_3Cl, AlCl_3}$ $X_2 \rightarrow$  \rightarrow $\xrightarrow{KOH, H_2O, t^{\circ}}$ $X_3 \rightarrow$ этилбензоат</p>
<p>50.</p>	<p>пропанол-1 $\xrightarrow{H_2SO_4, 150^{\circ}C}$ $X_1 \xrightarrow{Br_2}$ $X_2 \rightarrow$ пропин $\xrightarrow{t^{\circ}, \text{кат.}}$ \rightarrow $\rightarrow X_3 \xrightarrow{KMnO_4, H_2SO_4, t^{\circ}}$ </p>
<p>51.</p>	<p>этанол $\xrightarrow[t^{\circ}]{Cu}$ $X_1 \xrightarrow[t^{\circ}]{Cu(OH)_2}$ $X_2 \xrightarrow{Ca(OH)_2}$ $X_3 \xrightarrow{t^{\circ}}$ $X_4 \xrightarrow{H_2, \text{кат.}}$ пропанол-2</p>
<p>52.</p>	<p>бутадиен-1,3 \rightarrow бутен-2 $\xrightarrow[t^{\circ}]{KMnO_4, H_2SO_4}$ $X_1 \xrightarrow{CH_3CH_2OH, H^+}$ $X_2 \xrightarrow{Ca(OH)_2}$ \rightarrow $\rightarrow X_3 \rightarrow$ ацетон</p>
<p>53.</p>	<p>$C_2H_2 \rightarrow$ ацетальдегид $\xrightarrow{KMnO_4, KOH}$ $X_1 \xrightarrow{2\text{-бромпропан}}$ $X_2 \rightarrow$ \rightarrow пропанол-2 $\xrightarrow{CuO, t^{\circ}}$ X_3</p>
<p>54.</p>	<p>гексен-3 $\xrightarrow{KMnO_4, H_2SO_4, t^{\circ}}$ $X_1 \xrightarrow{Na}$ $X_2 \xrightarrow{NaOH, t^{\circ}}$ \rightarrow $\rightarrow X_3 \xrightarrow{Br_2}$ $X_4 \rightarrow$ этанол</p>
<p>55.</p>	<p>4-хлортолуол \rightarrow  $\xrightarrow{Cl_2, FeCl_3}$ $X_1 \xrightarrow{KMnO_4, H_2SO_4, t^{\circ}}$ \rightarrow $\rightarrow X_2 \xrightarrow{\text{изб. } NaHCO_3}$ $X_3 \xrightarrow{\text{изб. } CH_3I}$ X_4</p>
<p>56.</p>	<p>метилацетат $\xrightarrow{Ca(OH)_2}$ $X_1 \xrightarrow{t^{\circ}}$ $X_2 \xrightarrow{H_2, Pt}$ $X_3 \rightarrow$ \rightarrow пропен \rightarrow уксусная кислота</p>

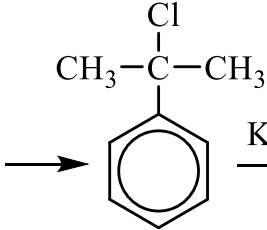
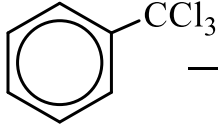
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57.	<p>бутират натрия $\xrightarrow{\text{NaOH}, t^{\circ}}$ $X_1 \longrightarrow$ 2-бромпропан $\xrightarrow[\text{спирт.}]{\text{KOH}, t^{\circ}}$ $X_2 \xrightarrow[\text{H}^+]{\text{H}_2\text{O}}$</p> <p>$\longrightarrow X_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^{\circ}}$ X_4</p>
58.	<p>пропен $\xrightarrow{\text{HBr}}$ $X_1 \xrightarrow{\text{KOH}, \text{H}_2\text{O}}$ $X_2 \xrightarrow[180\text{ }^{\circ}\text{C}]{\text{H}_2\text{SO}_4(\text{конц.})}$ $X_3 \xrightarrow[t^{\circ}]{\text{KMnO}_4, \text{H}_2\text{SO}_4}$</p> <p>$\longrightarrow X_4 \longrightarrow$ этилацетат</p>
59.	<p>$X_1 \xrightarrow{\text{Zn}}$ циклопропан $\xrightarrow{\text{HBr}, t^{\circ}}$ $X_2 \longrightarrow$ пропен $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0\text{ }^{\circ}\text{C}}$</p> <p>$\longrightarrow X_3 \xrightarrow{\text{изб. HBr}}$ X_4</p>
60.	<p>пропан $\xrightarrow{\text{Cr}_2\text{O}_3, t^{\circ}}$ $X_1 \xrightarrow{\text{Cl}_2}$ $X_2 \longrightarrow$ пропин \longrightarrow</p> <p>\longrightarrow  $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^{\circ}}$ X_3</p>
61.	<p>ацетат кальция $\xrightarrow{t^{\circ}}$ $X_1 \xrightarrow{\text{H}_2, \text{кат.}}$ $X_2 \xrightarrow[150\text{ }^{\circ}\text{C}]{\text{H}_2\text{SO}_4}$</p> <p>$\longrightarrow$ пропен $\xrightarrow[0\text{ }^{\circ}\text{C}]{\text{KMnO}_4, \text{H}_2\text{O}}$ $X_3 \longrightarrow$ 1,2-дихлорпропан</p>
62.	<p>циклопентан $\xrightarrow{\text{Br}_2}$ $X_1 \xrightarrow{\text{KOH}, \text{H}_2\text{O}}$ $X_2 \xrightarrow[180\text{ }^{\circ}\text{C}]{\text{H}_2\text{SO}_4}$</p> <p>$\longrightarrow X_3 \xrightarrow[t^{\circ}]{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ $\text{HO} \overset{\text{O}}{\parallel} (\text{CH}_2)_3 \overset{\text{O}}{\parallel} \text{COH} \xrightarrow{\text{избыток пропанола-2}}$ X_4</p>
63.	<p>$X_1 \xrightarrow{\text{Br}_2}$ бромэтан $\xrightarrow{\text{KOH}, \text{H}_2\text{O}, t^{\circ}}$ $X_2 \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4}$</p> <p>$\longrightarrow$ ацетальдегид $\longrightarrow X_2 \longrightarrow$ бутадиен-1,3</p>

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64.	<p>2-метилпропен $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ X₁ $\xrightarrow{\text{H}_2, \text{кат.}}$ X₂ \longrightarrow</p> <p>\longrightarrow изопропилацетат $\xrightarrow{\text{Ca(OH)}_2, \text{H}_2\text{O}, t^\circ}$ X₃ \longrightarrow ацетон</p>
65.	<p>CH₃-CH=CH-CH₃ $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ CH₃COOH $\xrightarrow{\text{CaCO}_3}$ X₁ $\xrightarrow{t^\circ}$</p> <p>\longrightarrow X₂ $\xrightarrow{\text{H}_2, \text{кат.}}$ X₃ \longrightarrow пропен</p>
66.	<p>бутен-2 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X₁ $\xrightarrow{2\text{HBr}}$ X₂ $\xrightarrow[\text{спирт}]{2\text{KOH}}$ X₃ \longrightarrow</p> <p>\longrightarrow бутанон $\xrightarrow{\text{H}_2, \text{кат.}}$ X₄</p>
67.	<p> \longrightarrow C₃H₇Br $\xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$ X₁ $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$</p> <p>$\longrightarrow$ X₂ \longrightarrow ацетат бария $\xrightarrow{t^\circ}$ X₃</p>
68.	<p>C₆H₆ $\xrightarrow{\text{C}_2\text{H}_4, \text{H}^+}$ X₁ $\xrightarrow{\text{Cl}_2, h\nu}$ X₂ \longrightarrow стирол $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$</p> <p>$\longrightarrow$ X₃ $\xrightarrow{\text{CH}_3\text{OH}, \text{H}^+, t^\circ}$ X₄</p>
69.	<p>X₁ $\xrightarrow{\text{C}_{\text{акт.}}, t^\circ}$ C₆H₆ $\xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3}$ X₂ $\xrightarrow{\text{HNO}_3, \text{H}_2\text{SO}_4, t^\circ}$</p> <p>$\longrightarrow$ X₃ $\xrightarrow{2\text{Cl}_2, h\nu}$ X₄ \longrightarrow <i>n</i>-нитробензальдегид</p>
70.	<p>CH₄ $\xrightarrow{t^\circ}$ X₁ $\xrightarrow{\text{C}_{\text{акт.}}, t^\circ}$ X₂ \longrightarrow толуол $\xrightarrow{\text{Cl}_2, h\nu}$ X₃ $\xrightarrow{\text{Na}}$ X₄</p>
71.	<p>C₂H₂ $\xrightarrow{\text{C}_{\text{акт.}}, t^\circ}$ X₁ $\xrightarrow{\text{изб. H}_2, \text{кат.}}$ X₂ $\xrightarrow{\text{Br}_2, h\nu}$ X₃ \longrightarrow</p> <p>\longrightarrow  $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X₄</p>

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72.	<p>пропаналь $\xrightarrow{\text{H}_2, \text{кат.}}$ X_1 $\xrightarrow{\text{HBr}}$ X_2 $\xrightarrow{\text{C}_6\text{H}_6, \text{кат.}}$ пропен $\xrightarrow{\quad}$</p> <p>$\xrightarrow{\quad}$ X_3 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ X_4</p>
73.	<p>фенол $\xrightarrow{\text{изб. H}_2, \text{кат.}}$ X_1 $\xrightarrow{\text{HBr}}$ X_2 $\xrightarrow{\text{KOH (спирт. р-р), } t^\circ}$</p> <p>$\xrightarrow{\quad}$ X_3 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ X_4 $\xrightarrow{\quad}$ $\text{CH}_3\text{OC}(=\text{O})(\text{CH}_2)_4\text{COCH}_3$</p>
74.	<p>ацетальдегид $\xrightarrow{\text{KMnO}_4, \text{KOH}}$ X_1 $\xrightarrow{\text{KOH, } t^\circ}$ X_2 $\xrightarrow{\text{Cl}_2, h\nu}$</p> <p>$\xrightarrow{\quad}$ X_3 $\xrightarrow{\quad}$ CH_3OH $\xrightarrow{\text{H}_2\text{SO}_4(\text{конц.}), t^\circ}$ X_4</p>
2015	
75.	<p>$\text{C}_6\text{H}_5\text{-COONa} \xrightarrow{\text{NaOH, } t^\circ} X_1 \xrightarrow[\text{H}_3\text{PO}_4]{\text{CH}_3\text{CH}=\text{CH}_2} X_2 \xrightarrow{\text{Cl}_2, h\nu}$</p> <p>$\xrightarrow{\quad}$  $\xrightarrow{\text{KOH (спирт. р-р)}}$ $X_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X_4</p>
76.	<p>гексан $\xrightarrow{\text{Pt, } t^\circ}$ $X_1 \xrightarrow{\text{CH}_3\text{Cl, AlCl}_3}$ $X_2 \xrightarrow{\quad}$  $\xrightarrow{\quad}$</p> <p>$\xrightarrow[\text{H}_2\text{O}]{\text{изб. KOH, } t^\circ}$ $X_3 \xrightarrow{\quad}$ X_1</p>
77.	<p>$X_1 \xrightarrow{\text{Br}_2, \text{свет}}$ 2-бромпропан $\xrightarrow{\quad}$ 2,3-диметилбутан $\xrightarrow{\text{Br}_2, \text{свет}}$</p> <p>$\xrightarrow{\quad}$ $X_2 \xrightarrow{\text{KOH (спирт.)}}$ $X_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X_4</p>

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78.	$\text{CH}_2\text{BrCH}_2\text{CH}_2\text{Br} \xrightarrow{\text{Zn}} \text{X}_1 \xrightarrow{\text{HCl}, t^\circ} \text{X}_2 \xrightarrow{\text{пропен}} \text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C} \longrightarrow$ $\longrightarrow \text{X}_3 \longrightarrow \text{1,2-дибромпропан}$
79.	$\text{ацетат натрия} \longrightarrow \text{метан} \xrightarrow{1 \text{ моль } \text{Cl}_2, \text{ свет}} \text{X}_1 \xrightarrow{\text{NaOH}_{(\text{водн.})}, t^\circ} \text{X}_2 \longrightarrow$ $\longrightarrow \text{метаналь} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{X}_3$
80.	$\text{пропанол-1} \xrightarrow{\text{HBr}, t^\circ} \text{X}_1 \longrightarrow \text{пропен} \xrightarrow{\text{H}_2\text{O}, \text{H}^+} \text{X}_2 \longrightarrow$ $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, t^\circ} \text{ацетон} \longrightarrow \text{X}_2$
81.	$\text{бромэтан} \xrightarrow{\text{NaOH}, \text{H}_2\text{O}} \text{X}_1 \longrightarrow \text{CH}_3\text{COOH} \xrightarrow{\text{NaOH}} \text{X}_2 \xrightarrow{\text{NaOH}, t^\circ} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{1500^\circ\text{C}} \text{X}_4$
82.	$\text{толуол} \xrightarrow{1 \text{ моль } \text{Cl}_2, \text{ свет}} \text{X}_1 \xrightarrow{\text{NaOH}_{(\text{водн.})}} \text{X}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \longrightarrow$ $\longrightarrow \text{C}_6\text{H}_5\text{-COOH} \xrightarrow{\text{NaHCO}_3} \text{X}_3 \xrightarrow[\text{сплавление}]{\text{NaOH}_{(\text{тв.})}} \text{X}_4$
83.	$\text{CH}_4 \longrightarrow \text{C}_2\text{H}_2 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} \text{X}_1 \xrightarrow{\text{Cu}(\text{OH})_2, t^\circ} \text{X}_2 \xrightarrow{\text{NaOH}} \text{X}_3 \longrightarrow \text{CH}_4$
84.	$\text{CH}_3\text{COOH} \xrightarrow{\text{CaCO}_3} \text{X}_1 \xrightarrow{t^\circ} \text{X}_2 \longrightarrow \text{CH}_3\underset{\text{OH}}{\text{CH}}\text{CH}_3 \xrightarrow{\text{HCl}} \longrightarrow$ $\longrightarrow \text{X}_3 \longrightarrow \text{2,3-диметилбутан}$
85.	$\text{этилацетат} \xrightarrow{\text{Ca}(\text{OH})_2, \text{H}_2\text{O}, t^\circ} \text{X}_1 \xrightarrow{t^\circ} \text{ацетон} \xrightarrow{\text{H}_2} \text{X}_2 \xrightarrow{\text{H}_2\text{SO}_4, 180^\circ\text{C}} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}} \text{пропандиол-1,2}$

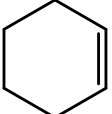
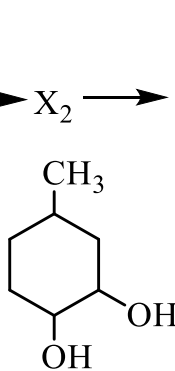
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86.	$\text{CaC}_2 \xrightarrow{\text{H}_2\text{O}} \text{X}_1 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} \text{X}_2 \xrightarrow{\text{Ba(OH)}_2} \text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$ $\xrightarrow{\text{X}_3 \xrightarrow{t^\circ} \text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3}$
2014	
87.	$\text{X}_1 \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{C}_6\text{H}_6 \xrightarrow{\text{Cl}_2, \text{FeCl}_3} \text{X}_2 \longrightarrow \text{X}_3 \longrightarrow$ $\longrightarrow \text{CH}_3-\text{C}_6\text{H}_4-\text{NO}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_4$
88.	$\text{CH}_3\text{CHBrCH}_2\text{CH}_2\text{Br} \xrightarrow{\text{Zn}} \text{X}_1 \xrightarrow{\text{HBr}} \text{X}_2 \longrightarrow \text{3,4-диметилгексан} \xrightarrow{\text{кат.}, t^\circ} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{C}_6\text{H}_4(\text{COOH})_2$
89.	$\text{ацетилен} \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_1 \longrightarrow \text{C}_6\text{H}_5\text{CH}_2\text{CH}_3 \xrightarrow{\text{Cl}_2, \text{свет}} \text{X}_2 \longrightarrow$ $\longrightarrow \text{C}_6\text{H}_5\text{CH}(\text{OH})\text{CH}_3 \xrightarrow{\text{CuO}, t^\circ} \text{X}_3$
90.	$\text{пропионат бария} \xrightarrow{t^\circ} \text{X}_1 \xrightarrow{\text{H}_2, \text{кат.}} \text{X}_2 \xrightarrow{\text{H}_2\text{SO}_4, 150^\circ\text{C}} \longrightarrow$ $\longrightarrow \text{пентен-2} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}} \text{X}_3 \longrightarrow \text{2,3-дихлорпентан}$
91.	$\text{глюкоза} \xrightarrow{\text{дрожжи}} \text{X}_1 \xrightarrow{\text{CuO}, t^\circ} \text{CH}_3\text{CHO} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \longrightarrow$ $\longrightarrow \text{X}_2 \xrightarrow{\text{Cl}_2, \text{P}_{\text{красн.}}} \text{X}_3 \longrightarrow \text{глицин}$
92.	$\text{ацетилен} \xrightarrow{\text{изб. } [\text{Ag}(\text{NH}_3)_2]\text{OH}} \text{X}_1 \xrightarrow{\text{изб. HCl}} \text{X}_2 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4} \text{уксусная кислота} \xrightarrow{\text{Br}_2, \text{P}_{\text{красн.}}} \text{X}_4$

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93.	$\begin{array}{l} \text{гептан} \xrightarrow{\text{Pt}, t^{\circ}} X_1 \xrightarrow[\text{KOH}]{\text{KMnO}_4} X_2 \xrightarrow{\text{KOH}, t^{\circ}} \\ \longrightarrow \text{бензол} \xrightarrow[\text{H}_2\text{SO}_4]{\text{HNO}_3} X_3 \xrightarrow{\text{Fe}, \text{HCl}} X_4 \end{array}$
94.	$\begin{array}{l} \text{C}_3\text{H}_8 \longrightarrow \text{пропен} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^{\circ}\text{C}} X_1 \xrightarrow{\text{изб. HBr}} \\ \longrightarrow X_2 \xrightarrow{\text{изб. KOH (спирт.)}, t^{\circ}} X_3 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}, \text{H}^+} X_4 \end{array}$
95.	$\begin{array}{l} \text{C}_3\text{H}_8 \xrightarrow{\text{Br}_2, h\nu} X_1 \longrightarrow (\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2 \longrightarrow \\ \longrightarrow \text{2-бром-2,3-диметилбутан} \xrightarrow{\text{KOH (спирт.)}, t^{\circ}} X_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^{\circ}\text{C}} X_3 \end{array}$
96.	$\begin{array}{l} \text{C}_2\text{H}_2 \longrightarrow \text{C}_6\text{H}_6 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3} X_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^{\circ}} X_2 \xrightarrow{\text{C}_2\text{H}_5\text{OH}, \text{H}^+} \\ \longrightarrow X_3 \longrightarrow \text{бензоат калия} \end{array}$
97.	$\text{C}_2\text{H}_2 \longrightarrow X_1 \xrightarrow{\text{KMnO}_4, \text{H}^+} \text{CH}_3\text{COOH} \longrightarrow X_2 \longrightarrow \text{CH}_4 \xrightarrow{\text{HNO}_3, t^{\circ}, p} X_3$
98.	$\begin{array}{l} \text{C}_3\text{H}_7\text{OH} \xrightarrow{\text{Al}_2\text{O}_3, 400^{\circ}\text{C}} X_1 \longrightarrow \text{пропандиол-1,2} \xrightarrow{\text{изб. HBr}} \\ \longrightarrow X_2 \xrightarrow{\text{изб. KOH (спирт.)}, t^{\circ}} X_3 \longrightarrow \text{1,3,5-триметилбензол} \end{array}$
99.	$\begin{array}{l} \text{этан} \xrightarrow{\text{Br}_2} X_1 \xrightarrow{\text{KOH}, \text{H}_2\text{O}, t^{\circ}} X_2 \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4} \text{этаналь} \longrightarrow \\ \longrightarrow X_2 \longrightarrow \text{дивинил} \end{array}$
100.	$\begin{array}{l} \text{C}_6\text{H}_5\text{-CHO} \xrightarrow{\text{KMnO}_4, \text{KOH}} X_1 \longrightarrow \text{бензол} \xrightarrow{\text{HNO}_3, \text{H}_2\text{SO}_4, t^{\circ}} \\ \longrightarrow X_2 \xrightarrow{\text{Br}_2, \text{FeBr}_3} X_3 \longrightarrow \text{броманилин} \end{array}$
101.	$\begin{array}{l} \text{гексан} \longrightarrow \text{C}_6\text{H}_6 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3} X_1 \xrightarrow{3\text{Cl}_2, h\nu} X_2 \xrightarrow{\text{KOH}, \text{H}_2\text{O}, t^{\circ}} \\ \longrightarrow X_3 \longrightarrow \text{метилбензоат} \end{array}$

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102.	$\text{CH}_3\text{COOK} \xrightarrow{\text{KOH}, t^\circ} \text{X}_1 \xrightarrow{\text{Br}_2, h\nu} \text{X}_2 \xrightarrow{\text{KOH}_{(\text{водн.})}, t^\circ} \text{X}_3 \longrightarrow$ $\longrightarrow \text{CH}_2\text{O} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_4$
103.	$1,3\text{-дибромпропан} \xrightarrow{\text{Zn}} \text{X}_1 \xrightarrow{\text{HCl}, t^\circ} \text{X}_2 \xrightarrow[\text{H}_2\text{O}]{\text{KOH}} \text{X}_3 \xrightarrow[\text{H}_2\text{SO}_4, t^\circ]{\text{KMnO}_4}$ $\longrightarrow \text{пропионовая кислота} \longrightarrow \text{изопропилпропионат}$
104.	$\text{бензол} \longrightarrow \text{циклогексан} \xrightarrow{\text{Cl}_2, h\nu} \text{X}_1 \xrightarrow{\text{KOH (спирт. р-р)}, t^\circ} \longrightarrow$ $\longrightarrow \text{циклогексен} \xrightarrow{\text{H}_2\text{O}, \text{H}_3\text{PO}_4, t^\circ} \text{X}_2 \xrightarrow{\text{CuO}, t^\circ} \text{X}_3$ 
105.	$\text{метилацетат} \longrightarrow \text{Ca}(\text{CH}_3\text{COO})_2 \xrightarrow{t^\circ} \text{X}_1 \longrightarrow$ $\longrightarrow \text{CH}_3\text{-CH(OH)-CH}_3 \xrightarrow{\text{H}_2\text{SO}_4, 160^\circ\text{C}} \text{X}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_3$
106.	$\text{циклопропан} \xrightarrow{\text{HBr}, t^\circ} \text{X}_1 \xrightarrow{\text{Na}, t^\circ} \text{X}_2 \xrightarrow{t^\circ, \text{кат.}} \text{C}_6\text{H}_6 \xrightarrow{\text{CH}_3\text{Br}, \text{AlBr}_3, t^\circ} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{бензойная кислота}$
107.	$\text{гептан} \xrightarrow{\text{Pt}, t^\circ} \text{X}_1 \xrightarrow{\text{Cl}_2, \text{AlCl}_3} \text{X}_2 \longrightarrow \text{1-хлор-4-метилциклогексан} \xrightarrow{\text{KOH (спирт. р-р)}, t^\circ} \longrightarrow$ $\longrightarrow \text{X}_3 \longrightarrow \text{1,2-дигидрокси-4-метилциклогексан}$ 

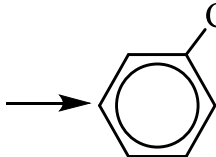
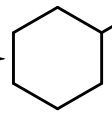
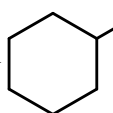
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<p>108.</p>	
<p>109.</p>	

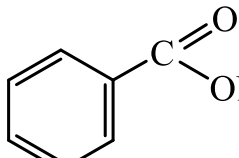
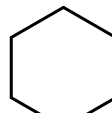
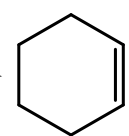
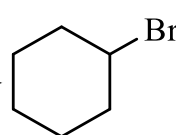
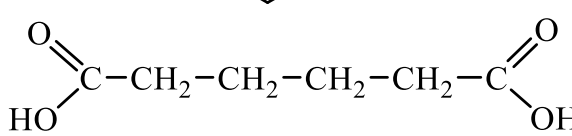
2013

<p>110.</p>	
<p>111.</p>	
<p>112.</p>	

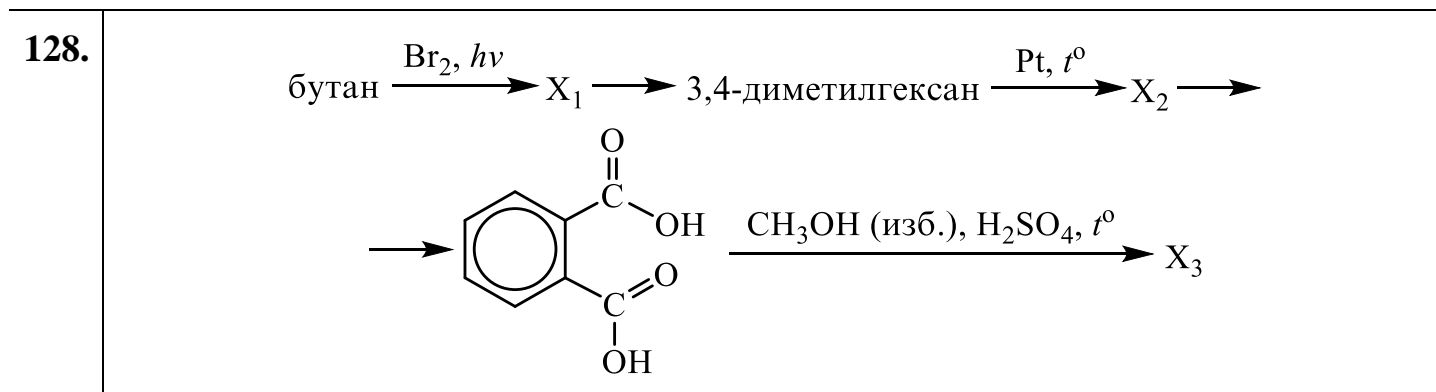
Задание 33 ЕГЭ по химии

113.	<p>бутадиен-1,3 $\xrightarrow{2\text{H}_2, \text{кат.}}$ $\text{X}_1 \xrightarrow{\text{AlCl}_3, t^\circ}$ 2-метилпропан $\xrightarrow{\text{Br}_2, h\nu}$</p> <p>$\rightarrow \text{X}_2 \xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$ $\text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ $\text{CH}_3-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{CH}_3$</p>
114.	<p>$\text{C}_6\text{H}_5-\text{COONa} \rightarrow \text{C}_6\text{H}_6 \xrightarrow{\text{C}_2\text{H}_4, \text{H}_3\text{PO}_4}$ $\text{X}_1 \xrightarrow{\text{Cl}_2, h\nu}$ $\text{X}_2 \rightarrow$</p> <p>\rightarrow  $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ X_3</p>
115.	<p>ацетилен $\xrightarrow{\text{C}_{\text{акт.}}, t^\circ}$ $\text{X}_1 \xrightarrow{\text{H}_2, \text{Pt}}$ $\text{X}_2 \xrightarrow{\text{Cl}_2, h\nu}$  $\xrightarrow{\text{KOH (спирт. р-р)}, t^\circ}$</p> <p>$\rightarrow \text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X_4</p>
116.	<p>этаналь $\xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4}$ $\text{X}_1 \rightarrow$ этилацетат $\xrightarrow{\text{H}_2\text{O}, \text{H}^+}$</p> <p>$\rightarrow \text{X}_2 \rightarrow$ этилат натрия $\rightarrow \text{C}_2\text{H}_5-\text{O}-\text{CH}_3$</p>
117.	<p>гексан \rightarrow бензол $\xrightarrow{\text{H}_2, \text{Pt}}$ $\text{X}_1 \xrightarrow{\text{Cl}_2, h\nu}$ $\text{X}_2 \rightarrow$  $\xrightarrow[\text{H}_2\text{SO}_4]{\text{K}_2\text{Cr}_2\text{O}_7}$ X_3</p>
118.	<p>этилат калия $\xrightarrow{\text{H}_2\text{O}}$ $\text{X}_1 \rightarrow$ хлорэтан $\rightarrow \text{X}_2 \rightarrow$</p> <p>$\rightarrow$ этиленгликоль $\xrightarrow{\text{CH}_3\text{COOH}, \text{H}^+}$ X_3</p>
119.	<p>ацетат калия $\xrightarrow{\text{электролиз раствора}}$ $\text{X}_1 \xrightarrow{t^\circ, \text{кат.}}$ этилен $\xrightarrow{\text{H}_2\text{O}, \text{H}^+}$</p> <p>$\rightarrow \text{X}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ $\text{X}_3 \xrightarrow{\text{X}_2, \text{H}^+}$ X_4</p>
120.	<p>$\text{HC}\equiv\text{CH} \xrightarrow{\text{H}_2\text{O} (\text{Hg}^{2+})}$ $\text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ $\text{CH}_3\text{COOH} \xrightarrow{\text{NaOH}}$</p> <p>$\rightarrow \text{X}_2 \xrightarrow{\text{CH}_3\text{I}}$ $\text{X}_3 \xrightarrow{\text{H}_2\text{O} (\text{H}^+)}$ уксусная кислота</p>

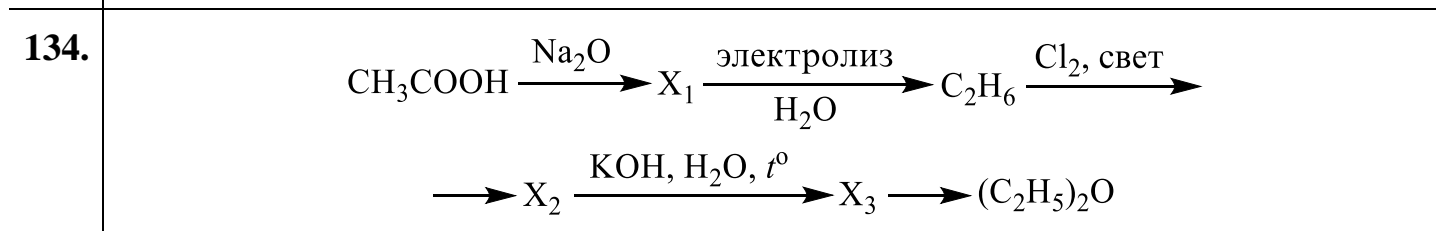
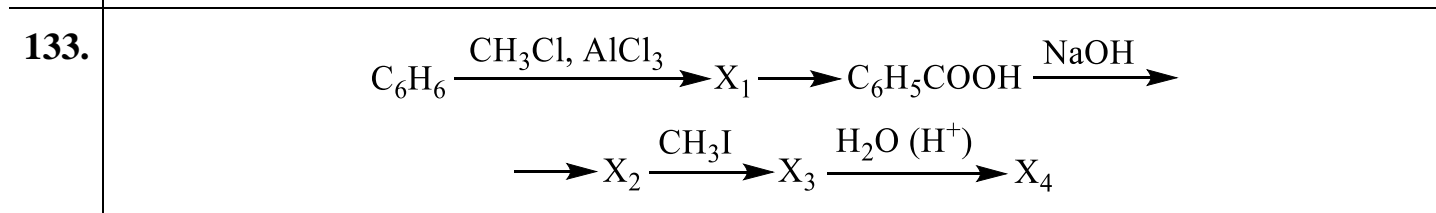
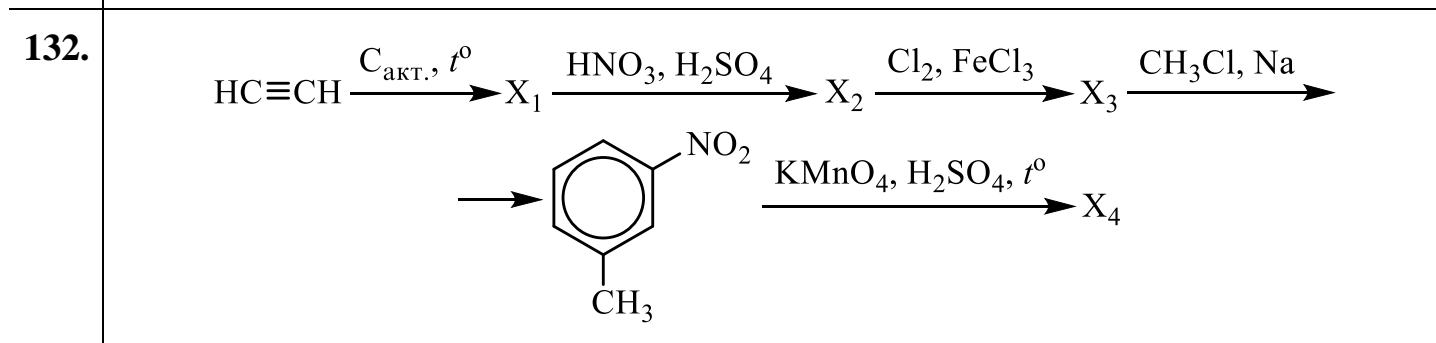
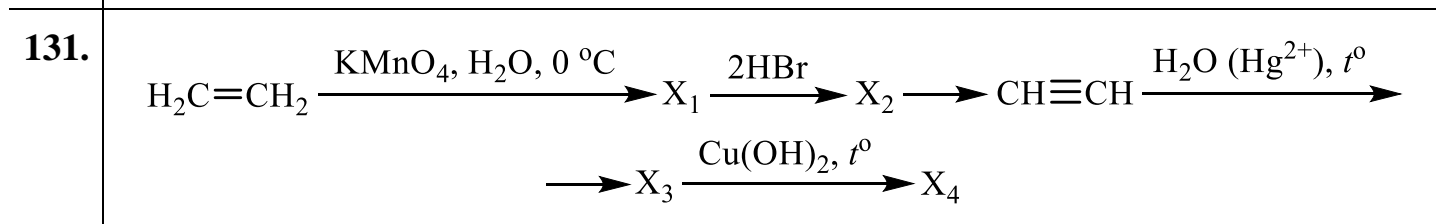
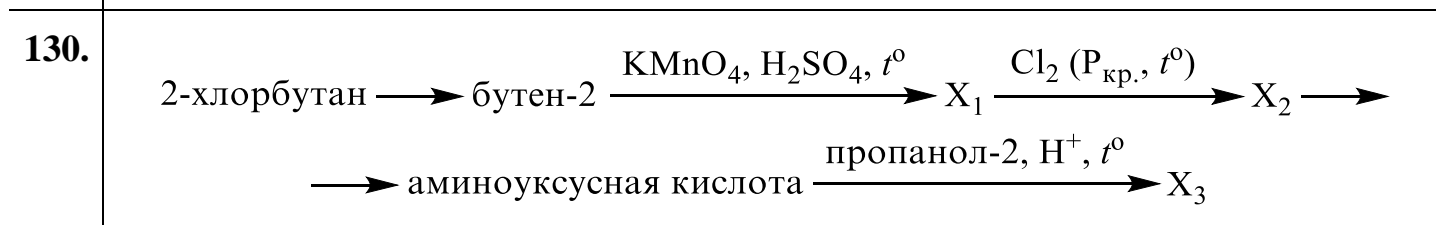
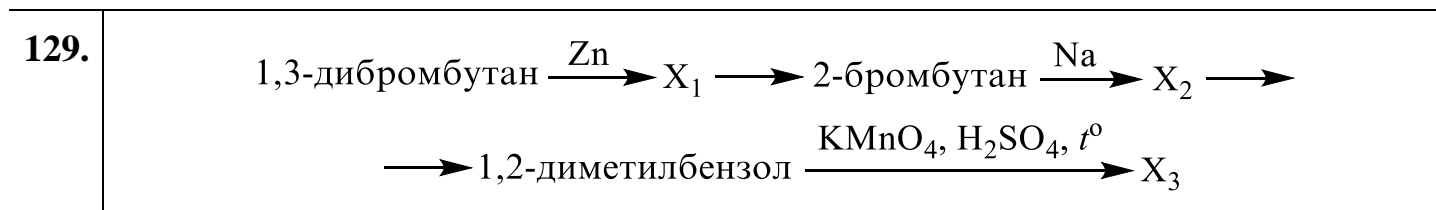
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121.	<p>1-бромпропан $\xrightarrow{\text{Na}}$ $X_1 \xrightarrow{t^\circ, \text{Pt}}$ $X_2 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3}$ $X_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$</p> <p>$\longrightarrow \text{C}_6\text{H}_5\text{COOH} \xrightarrow{\text{NaOH}}$ X_4</p>
122.	<p>толуол $\xrightarrow{\text{Cl}_2, \text{свет}}$ $X_1 \xrightarrow{\text{NaOH}_{(\text{водн.})}}$ $X_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$</p> <p>$\longrightarrow \text{C}_6\text{H}_5\text{COOH} \xrightarrow{\text{NaHCO}_3}$ $X_3 \xrightarrow[\text{сплавление}]{\text{NaOH}_{(\text{тв.})}}$ X_4</p>
123.	<p>ацетальдегид $\xrightarrow{\text{KMnO}_4, \text{KOH}}$ ацетат калия $\xrightarrow{\text{H}_2\text{SO}_4}$ $X_1 \xrightarrow{\text{C}_2\text{H}_5\text{OH}, t^\circ, \text{H}^+}$</p> <p>$\longrightarrow X_2 \longrightarrow$ ацетат кальция $\xrightarrow{t^\circ}$ X_3</p>
124.	<p>$\text{CH}_4 \xrightarrow{t^\circ}$ $X_1 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}}$ $\text{CH}_3\text{C} \begin{array}{l} \text{=O} \\ \text{H} \end{array} \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4}$ $X_2 \xrightarrow{\text{Ba}(\text{OH})_2}$</p> <p>$\longrightarrow X_3 \xrightarrow{t^\circ}$ $\text{CH}_3\text{C} \begin{array}{l} \text{O} \\ \parallel \\ \text{CH}_3 \end{array}$</p>
125.	<p> $\xrightarrow{\text{NaOH}, t^\circ}$ $X_1 \longrightarrow$  $\xrightarrow{\text{Br}_2, h\nu}$ $X_2 \longrightarrow$</p> <p>\longrightarrow  $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ X_3</p>
126.	<p>$X_1 \xrightarrow{\text{H}_2, \text{Ni}}$ пропанол-2 $\xrightarrow{\text{HBr}}$ $X_2 \longrightarrow$ пропен $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$</p> <p>$\longrightarrow X_3 \xrightarrow{\text{CH}_3\text{COOH} (\text{изб.}), \text{H}_2\text{SO}_4, t^\circ}$ X_4</p>
127.	<p>бензол $\xrightarrow{\text{H}_2, \text{Pt}}$ $X_1 \longrightarrow$  $\xrightarrow{\text{KOH} (\text{спирт. р-р}), t^\circ}$ $X_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$</p> <p>$\longrightarrow$  $\xrightarrow{\text{CH}_3\text{OH} (\text{изб.}), \text{H}_2\text{SO}_4, t^\circ}$ X_3</p>

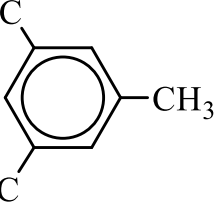
Задание 33 ЕГЭ по химии



2012



Задание 33 ЕГЭ по химии

135.	$\text{CH}_2=\text{CH}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}} \text{X}_1 \xrightarrow{\text{изб. HBr}} \text{X}_2 \longrightarrow$ $\longrightarrow \text{этин} \xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}} \text{X}_3 \longrightarrow \text{этин}$
136.	$\text{этин} \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{CH}_3\text{COOH} \xrightarrow{\text{Cl}_2, \text{P}_{\text{красн.}}} \longrightarrow$ $\longrightarrow \text{X}_2 \longrightarrow \text{глицин} \xrightarrow{\text{Ba}(\text{OH})_2} \text{X}_3$
137.	$\text{этанол} \longrightarrow \text{X}_1 \xrightarrow{\text{изб. H}_2, \text{кат.}} \text{бутан} \xrightarrow{\text{Cl}_2, h\nu} \text{X}_2 \longrightarrow$ $\longrightarrow \text{бутен-2} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_3$
138.	$\text{пропанол-1} \xrightarrow{\text{Al}_2\text{O}_3, 400^\circ\text{C}} \text{X}_1 \longrightarrow \text{1,2-дибромпропан} \xrightarrow{\text{KOH (спирт. р-р), } t^\circ} \longrightarrow$ $\longrightarrow \text{X}_2 \longrightarrow \text{C}_6\text{H}_3(\text{CH}_3)_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_3$ 
2011	
139.	$\text{C}_6\text{H}_6 \xrightarrow{\text{C}_2\text{H}_5\text{Cl}, \text{AlCl}_3} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_2 \xrightarrow{t^\circ, \text{кат.}} \longrightarrow$ $\longrightarrow \text{C}_6\text{H}_6 \xrightarrow{\text{HNO}_3, \text{H}_2\text{SO}_4} \text{X}_3 \longrightarrow \text{C}_6\text{H}_5\text{-NH}_2$
140.	$\text{C}_3\text{H}_8 \xrightarrow{\text{Br}_2, \text{свет}} \text{X}_1 \xrightarrow{\text{KOH} + \text{H}_2\text{O}} \text{X}_2 \longrightarrow \text{C}_3\text{H}_6 \xrightarrow{\text{Br}_2} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{изб. KOH (спиртов.), } t^\circ} \text{X}_4$
141.	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH} \xrightarrow[180^\circ\text{C}]{\text{H}_2\text{SO}_4} \text{X}_1 \xrightarrow{\text{HCl}} \text{X}_2 \xrightarrow{\text{NaOH}, \text{H}_2\text{O}} \longrightarrow$ $\longrightarrow \text{X}_3 \longrightarrow \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}} \text{X}_4$

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142.	$X_1 \longrightarrow \text{бензол} \xrightarrow{C_2H_4, H^+} X_2 \xrightarrow{KMnO_4, H_2SO_4, t^0} \longrightarrow X_3 \xrightarrow{CH_3OH, t^0, H^+} X_4 \longrightarrow CO_2$
143.	$CH_3C \equiv CAg \xrightarrow{HCl} X_1 \xrightarrow{HBr \text{ (изб.)}} X_2 \longrightarrow X_1 \xrightarrow{H_2O, Hg^{2+}} \longrightarrow \text{ацетон} \xrightarrow{H_2, \text{кат.}, t^0} X_3$
144.	$C_3H_8 \longrightarrow C_3H_6 \xrightarrow{Br_2} X_1 \longrightarrow CH_3C \equiv CH \xrightarrow[Hg^{2+}, H^+]{H_2O} \longrightarrow X_2 \longrightarrow CH_3-CH(OH)-CH_3$
145.	$\text{ацетилен} \xrightarrow{C_{\text{акт.}}, t^0} X_1 \xrightarrow{C_2H_5Cl, AlCl_3} X_2 \xrightarrow{Cl_2, \text{свет}} X_3 \longrightarrow \text{стирол} \longrightarrow \text{полистирол}$
146.	$C_2H_5COONa \xrightarrow{NaOH \text{ (сплав.)}} X_1 \longrightarrow \text{бромэтан} \xrightarrow{KOH \text{ (спирт.)}, t^0} \longrightarrow X_2 \xrightarrow{Br_2} X_3 \xrightarrow{\text{изб. KOH (водн.)}, t^0} X_4$
147.	$\text{ацетальдегид} \xrightarrow{H_2, \text{кат.}} X_1 \longrightarrow \text{бромэтан} \longrightarrow \text{бутан} \xrightarrow{t^0, \text{кат.}} \longrightarrow X_2 \xrightarrow{2Br_2} X_3$
148.	$\text{толуол} \xrightarrow{KMnO_4, H_2SO_4, t^0} X_1 \xrightarrow{KOH} X_2 \longrightarrow \text{бензол} \xrightarrow{HNO_3, H_2SO_4, t^0} \longrightarrow X_3 \longrightarrow \text{анилин}$
149.	$\text{толуол} \xrightarrow{Cl_2, \text{свет}} X_1 \xrightarrow{NaOH_{\text{(водн.)}}} X_2 \xrightarrow{KMnO_4, H_2SO_4} \longrightarrow C_6H_5-COOH \xrightarrow{Na} X_3 \xrightarrow[\text{сплавление}]{NaOH_{\text{(ТВ.)}}} X_4$
150.	$C_2H_2 \xrightarrow{[Ag(NH_3)_2]OH} X_1 \xrightarrow{HCl} X_2 \xrightarrow{H_2O} CH_3CHO \xrightarrow{H_2} X_3 \longrightarrow \text{этилацетат}$

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151.	<p> <chem>c1ccccc1C(=O)O</chem> \rightarrow X_1 $\xrightarrow{\text{NaOH}, t^\circ}$ <chem>c1ccccc1O</chem> $\xrightarrow[\text{AlCl}_3]{\text{CH}_3\text{-CH=CH}_2}$ X_2 X_2 $\xrightarrow{\text{O}_2, \text{H}_2\text{SO}_4}$ <chem>c1ccc(O)cc1</chem> $\xrightarrow{3\text{Br}_2}$ X_3 </p>
152.	<p> ацетат калия $\xrightarrow{\text{KOH, сплавл.}}$ X_1 \rightarrow C_2H_2 $\xrightarrow{\text{C}_{\text{акт.}}, t^\circ}$ X_2 \rightarrow X_2 \rightarrow <chem>c1ccc(C)cc1</chem> \rightarrow бензоат калия </p>
2010	
153.	<p> 1-хлорбутан $\xrightarrow{\text{NaOH (спиртов.)}, t^\circ}$ X_1 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ пропионовая кислота \rightarrow X_1 \rightarrow изопропилпропионат $\xrightarrow{\text{NaOH (водн.)}, t^\circ}$ X_2 $\xrightarrow{\text{NaOH (тв.)}, \text{сплавл.}}$ X_3 </p>
154.	<p> циклопропан \rightarrow 1-бромпропан $\xrightarrow{\text{Na}}$ X_1 $\xrightarrow[300^\circ\text{C}]{\text{Pt}}$ X_2 \rightarrow X_1 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ}$ X_3 </p>
155.	<p> $\text{C}_2\text{H}_5\text{Cl}$ \rightarrow C_3H_8 $\xrightarrow{t^\circ, \text{Pt}}$ X_1 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^\circ\text{C}}$ X_2 $\xrightarrow{\text{изб. HBr}}$ X_3 X_2 $\xrightarrow{2\text{KOH (спирт.)}, t^\circ}$ X_4 </p>
156.	<p> этан $\xrightarrow{\text{Br}_2}$ X_1 $\xrightarrow{\text{KOH, H}_2\text{O}, t^\circ}$ X_2 $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ этаналь \rightarrow X_2 \rightarrow дивинил </p>
157.	<p> CH_3CHO $\xrightarrow{\text{NaMnO}_4, \text{NaOH}}$ X_1 $\xrightarrow{\text{электролиз}}$ C_2H_6 $\xrightarrow{\text{Cl}_2, \text{свет}}$ X_2 X_1 $\xrightarrow{\text{KOH} + \text{H}_2\text{O}, t^\circ}$ X_3 $\xrightarrow{\text{H}_2\text{SO}_4 (\text{конц.}), t^\circ}$ $(\text{C}_2\text{H}_5)_2\text{O}$ </p>

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158.	$\text{CH}_3-\text{CH}_2-\text{CH}_2\text{Br} \longrightarrow \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, t^\circ} \text{CH}_3-\overset{\text{O}}{\underset{\text{OK}}{\text{C}}} \xrightarrow{\text{KOH, сплавл.}} \longrightarrow \text{X}_2 \longrightarrow \text{CH}\equiv\text{CH} \xrightarrow{\text{изб. } [\text{Ag}(\text{NH}_3)_2]\text{OH}} \longrightarrow \text{X}_3$
2009	
159.	$\text{X}_1 \xrightarrow{\text{Br}_2, \text{свет}} \text{CH}_3\text{Br} \xrightarrow{\text{изб. NH}_3} \text{X}_2 \xrightarrow{\text{HNO}_2} \text{X}_3 \xrightarrow{\text{CuO}, t^\circ} \longrightarrow \text{H}_2\text{CO} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{X}_4$
160.	$\text{CH}_3\text{CHCl}_2 \longrightarrow \text{CH}_3\text{CHO} \xrightarrow{\text{H}_2, \text{кат.}, t^\circ} \text{X}_1 \xrightarrow{\text{NH}_3, 300^\circ\text{C}, \text{кат.}} \longrightarrow \text{C}_2\text{H}_5-\text{NH}_2 \xrightarrow{\text{CO}_2 + \text{H}_2\text{O}} \text{X}_2 \xrightarrow{t^\circ} \text{X}_3$
161.	$\text{C}_2\text{H}_4\text{Br}_2 \xrightarrow{\text{KOH (спиртов.)}, t^\circ} \text{X}_1 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} \text{X}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \longrightarrow \text{CH}_3\text{COOH} \xrightarrow{\text{Cl}_2, \text{P}_{\text{красн.}}} \text{X}_3 \longrightarrow \text{H}_2\text{NCH}_2\text{COOH}$
162.	$\text{пропанол-1} \xrightarrow{\text{H}_2\text{SO}_4 (\text{конц.}), 180^\circ} \text{X}_1 \xrightarrow{\text{Br}_2} \text{X}_2 \longrightarrow \longrightarrow \text{пропин} \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} \text{X}_3 \xrightarrow{\text{H}_2, \text{кат.}} \text{X}_4$
163.	$(\text{C}_6\text{H}_{10}\text{O}_5)_n \xrightarrow{\text{H}_2\text{O}, \text{H}^+, t^\circ} \text{X}_1 \longrightarrow \text{CH}_3-\text{CH}(\text{OH})-\text{COOH} \xrightarrow{\text{HBr}} \longrightarrow \text{X}_2 \xrightarrow{\text{изб. KOH (спирт.)}, t^\circ} \text{X}_3 \xrightarrow{\text{HCl}} \text{X}_4$
164.	$\text{H}_2\text{C}=\text{CH}_2 \xrightarrow{\text{H}_2\text{O}, \text{H}^+} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{CH}_3-\overset{\text{O}}{\underset{\text{H}}{\text{C}}} \xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}, t^\circ} \longrightarrow \text{X}_2 \xrightarrow{\text{NaOH}, t^\circ} \text{X}_3 \longrightarrow \text{CH}_4$
165.	$\text{этаналь} \longrightarrow \text{ацетат калия} \longrightarrow \text{CH}_4 \xrightarrow{1500^\circ\text{C}} \text{X}_1 \longrightarrow \longrightarrow \text{K}_2\text{C}_2\text{O}_4 \xrightarrow{\text{H}_2\text{SO}_4 (\text{конц.}), t^\circ} \text{X}_2$

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166.	$\text{C}_3\text{H}_6 \xrightarrow{\text{Cl}_2, 500\text{ }^\circ\text{C}} \text{X}_1 \xrightarrow{\text{KOH (водн. р-р)}, t^\circ} \text{X}_2 \xrightarrow{\text{Br}_2} \text{X}_3 \xrightarrow{\text{NaOH (водн. р-р)}} \text{X}_4$ $\text{C}_3\text{H}_6 \xrightarrow{\text{изб. HNO}_3, \text{H}_2\text{SO}_4} \text{глицерин} \xrightarrow{\text{изб. HNO}_3, \text{H}_2\text{SO}_4} \text{X}_4$
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167.	$\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Al}_2\text{O}_3, 400\text{ }^\circ\text{C}} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0\text{ }^\circ\text{C}} \text{X}_2 \xrightarrow{\text{HBr (изб.)}} \text{X}_3 \longrightarrow$ $\text{X}_3 \longrightarrow \text{этин} \longrightarrow \text{C}_2\text{H}_4\text{O}$
168.	$\text{C}_2\text{H}_2 \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_1 \xrightarrow{\text{Cl}_2, \text{кат.}} \text{X}_2 \longrightarrow \text{толуол} \xrightarrow{1 \text{ моль HNO}_3, \text{H}_2\text{SO}_4} \text{X}_3$ $\text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_4$
169.	$\text{X}_1 \xrightarrow{\text{H}_2\text{O}, \text{Hg}^{2+}} (\text{CH}_3)_2\text{CO} \xrightarrow{\text{H}_2, \text{кат.}} \text{X}_2 \longrightarrow$ $\text{X}_2 \xrightarrow{\text{KOH (спиртов.)}, t^\circ} \text{X}_3 \longrightarrow \text{X}_1$ $\text{X}_1 \xrightarrow{\text{KOH (спиртов.)}, t^\circ} (\text{CH}_3)_2\text{CHBr} \xrightarrow{\text{KOH (спиртов.)}, t^\circ} \text{X}_3 \longrightarrow \text{X}_1$
170.	$\text{метан} \xrightarrow{1500\text{ }^\circ\text{C}} \text{X}_1 \xrightarrow{2\text{Na}, t^\circ} \text{X}_2 \longrightarrow \text{бутин-2} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_3$ $\text{X}_3 \longrightarrow \text{хлоруксусная кислота}$
171.	$\text{C}_2\text{H}_4 \longrightarrow \text{C}_2\text{H}_4\text{Cl}_2 \xrightarrow{\text{изб. KOH (спирт.)}, t^\circ} \text{X}_1 \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_2 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3} \text{X}_3$ $\text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{C}_6\text{H}_5\text{COOH}$
172.	$\text{CaC}_2 \longrightarrow \text{этин} \longrightarrow \text{этаналь} \xrightarrow{\text{KMnO}_4, \text{H}^+} \text{X}_1 \xrightarrow{\text{Cl}_2, \text{P}_{\text{красн.}}} \text{X}_2$ $\text{X}_2 \xrightarrow{\text{NH}_3 (\text{изб.})} \text{X}_3$
173.	$\text{CH}_4 \longrightarrow \text{HCHO} \xrightarrow{\text{H}_2, \text{кат.}} \text{X}_1 \xrightarrow{\text{Na}} \text{X}_2 \xrightarrow{\text{HCl}} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4, t^\circ} \text{X}_3$

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174.	$\text{CaCO}_3 \longrightarrow \text{CaC}_2 \longrightarrow \text{X}_1 \xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}} \text{Ag}_2\text{C}_2 \xrightarrow{\text{HCl}} \longrightarrow$ $\longrightarrow \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}} \text{X}_2$
175.	$\text{C}_6\text{H}_6 \xrightarrow{\text{C}_2\text{H}_5\text{Br, кат.}} \text{X}_1 \xrightarrow{\text{Br}_2, \text{свет}} \text{X}_2 \longrightarrow \text{C}_6\text{H}_5-\text{CH}(\text{OH})\text{CH}_3 \xrightarrow{\text{H}_2\text{SO}_4, t^\circ} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{полимеризация}} \text{X}_4$
176.	$\text{C}_2\text{H}_6 \xrightarrow{\text{HNO}_3, t^\circ} \text{X}_1 \xrightarrow{\text{H}_2, t^\circ, \text{кат.}} \text{X}_2 \xrightarrow{\text{HBr}} \text{X}_3 \xrightarrow{\text{NaOH}} \text{X}_2 \xrightarrow{\text{C}_2\text{H}_5\text{Br}} \text{X}_4$
177.	$\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{HBr}} \text{X}_1 \xrightarrow{\text{KOH (спиртов.)}, t^\circ} \text{X}_2 \xrightarrow{\text{кат.}} \text{C}_6\text{H}_5\text{C}_2\text{H}_5 \xrightarrow{\text{Br}_2, \text{свет}} \longrightarrow$ $\longrightarrow \text{X}_3 \xrightarrow{\text{KOH (спиртов.)}, t^\circ} \text{X}_4$
178.	$\text{H}_2\text{C}_2\text{O}_4 \longrightarrow \text{CO} \xrightarrow{\text{H}_2, t^\circ, \text{кат.}} \text{X}_1 \xrightarrow{\text{CH}_3\text{COOH, H}^+, t^\circ} \longrightarrow$ $\longrightarrow \text{X}_2 \xrightarrow{\text{NaOH, H}_2\text{O}, t^\circ} \text{X}_3 \longrightarrow \text{CH}_4$
179.	$\text{бутан} \xrightarrow{\text{O}_2, t^\circ, \text{кат.}} \text{уксусная кислота} \xrightarrow{\text{Ca}} \text{X}_1 \xrightarrow{t^\circ} \longrightarrow$ $\longrightarrow \text{ацетон} \xrightarrow{\text{H}_2, t^\circ, \text{кат.}} \text{X}_2 \xrightarrow{\text{HCOOH, H}^+, t^\circ} \text{X}_3$

Задания разных лет

180.	$\text{CH}_4 \longrightarrow \text{этин} \longrightarrow \text{винилацетилен} \xrightarrow{\text{изб. H}_2, \text{кат.}} \text{X}_1 \longrightarrow$ $\longrightarrow \text{этановая кислота} \xrightarrow{\text{NH}_3} \text{X}_2$
181.	$\text{метан} \xrightarrow{\text{HNO}_3 (\text{p-p}), t^\circ} \text{X}_1 \longrightarrow \text{метиламин} \longrightarrow \text{X}_2 \xrightarrow{\text{KOH}} \longrightarrow$ $\longrightarrow \text{метиламин} \longrightarrow \text{N}_2$

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182.	$\begin{aligned} \text{метилат калия} &\xrightarrow{\text{H}_2\text{O}} \text{X}_1 \longrightarrow \text{бромметан} \xrightarrow{\text{Na}} \text{X}_2 \xrightarrow{t^\circ, \text{кат.}} \\ &\longrightarrow \text{X}_3 \xrightarrow{\text{O}_2, \text{CuCl}_2, \text{PdCl}_2} \text{этаналь} \end{aligned}$
183.	$\begin{aligned} \text{целлюлоза} &\longrightarrow \text{X}_1 \longrightarrow \text{этанол} \xrightarrow{\text{CH}_3\text{COOH}, \text{H}^+, t^\circ} \text{X}_2 \longrightarrow \\ &\longrightarrow \text{CH}_3\text{COONa} \xrightarrow{\text{электролиз}} \text{X}_3 \end{aligned}$
184.	$\begin{aligned} \text{HCOOH} &\xrightarrow{\text{H}_2\text{SO}_4 (\text{конц.})} \text{X}_1 \longrightarrow \text{метанол} \xrightarrow{\text{HBr}} \text{X}_2 \xrightarrow{\text{Na}} \\ &\longrightarrow \text{X}_3 \xrightarrow{\text{HNO}_3 (\text{p-p}), t^\circ} \text{X}_4 \end{aligned}$
185.	$\begin{aligned} \text{ацетат натрия} &\xrightarrow{\text{NaOH} (\text{сплав.})} \text{X}_1 \xrightarrow{1500^\circ\text{C}} \text{X}_2 \xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \\ &\longrightarrow \text{C}_6\text{H}_6 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3} \text{X}_3 \xrightarrow{3\text{HNO}_3, \text{H}_2\text{SO}_4} \text{X}_4 \end{aligned}$
186.	$\begin{aligned} \text{CaC}_2 &\xrightarrow{\text{H}_2\text{O}} \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}} \text{K}_2\text{C}_2\text{O}_4 \xrightarrow{\text{H}_2\text{SO}_4 (\text{конц.}), t^\circ} \text{X}_2 \longrightarrow \\ &\longrightarrow \text{HCOOK} \xrightarrow{\text{H}_3\text{PO}_4 (\text{конц.})} \text{X}_3 \end{aligned}$
187.	$\begin{aligned} \text{этин} &\xrightarrow{\text{C}_{\text{акт.}}, t^\circ} \text{X}_1 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3} \text{толуол} \xrightarrow{\text{Cl}_2, \text{УФ}} \text{X}_2 \xrightarrow{\text{KOH} (\text{водн. p-p}), t^\circ} \\ &\longrightarrow \text{X}_3 \longrightarrow \text{C}_6\text{H}_5\text{-CH}_2\text{-OOSH} \end{aligned}$
188.	$\begin{aligned} \text{C}_3\text{H}_8 &\xrightarrow{t^\circ, \text{кат.}} \text{X}_1 \xrightarrow{\text{Cl}_2, 600^\circ\text{C}} \text{X}_2 \xrightarrow{\text{KOH}, \text{H}_2\text{O}, t^\circ} \text{X}_3 \longrightarrow \\ &\longrightarrow \text{глицерин} \longrightarrow \text{тринитрат глицерина} \end{aligned}$
189.	$\begin{aligned} \text{C}_2\text{H}_2 &\longrightarrow \text{бензол} \xrightarrow{\text{Cl}_2, \text{Fe}} \text{X}_1 \xrightarrow{\text{NaOH}, t^\circ, p} \\ &\longrightarrow \text{X}_2 \xrightarrow{\text{CO}_2, \text{H}_2\text{O}} \text{X}_3 \longrightarrow \text{2,4,6-тринитрофенол} \end{aligned}$

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190.	<p>2-хлорпропан $\xrightarrow{\text{KOH (спирт. р-р), } t^{\circ}}$ X₁ $\xrightarrow{\text{HBr, H}_2\text{O}_2}$ X₂ $\xrightarrow{\text{Na}}$ \longrightarrow</p> <p>\longrightarrow X₃ \longrightarrow бензол $\xrightarrow{\text{Cl}_2, \text{УФ}}$ X₄</p>
191.	<p>Al₄C₃ $\xrightarrow{\text{H}_2\text{O}}$ X₁ \longrightarrow этин $\xrightarrow{\text{C}_{\text{акт.}}, t^{\circ}}$ X₂ $\xrightarrow{\text{C}_2\text{H}_5\text{Cl, AlCl}_3}$ \longrightarrow</p> <p>\longrightarrow X₃ \longrightarrow стирол</p>
192.	<p>K \longrightarrow этилат калия $\xrightarrow{\text{H}_2\text{SO}_4 \text{ (р-р)}}$ X₁ $\xrightarrow{\text{H}_2\text{SO}_4 \text{ (конц.), } 180^{\circ}\text{C}}$ \longrightarrow</p> <p>\longrightarrow X₂ $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, 0^{\circ}\text{C}}$ X₃ \longrightarrow 1,2-дихлорэтан</p>
193.	<p>этилацетат $\xrightarrow{\text{NaOH, H}_2\text{O}, t^{\circ}}$ X₁ \longrightarrow CH₄ $\xrightarrow{1500^{\circ}\text{C}}$ X₂ \longrightarrow</p> <p>\longrightarrow винилацетилен $\xrightarrow{\text{изб. Br}_2}$ X₃</p>
194.	<p>бромметан $\xrightarrow{\text{Na}}$ X₁ $\xrightarrow{t^{\circ}, \text{кат.}}$ X₂ $\xrightarrow{\text{O}_2, \text{CuCl}_2, \text{PdCl}_2}$ \longrightarrow</p> <p>\longrightarrow X₃ $\xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}}$ X₄ \longrightarrow CH₃COOH</p>
195.	<p>CO₂ \longrightarrow глюкоза \longrightarrow CH₃-CH₂-CH₂-C $\begin{matrix} \text{O} \\ \parallel \\ \text{OH} \end{matrix}$ $\xrightarrow{\text{NaOH}}$ \longrightarrow</p> <p>\longrightarrow X₁ $\xrightarrow{\text{NaOH}, t^{\circ}}$ X₂ $\xrightarrow{\text{HNO}_3 \text{ (р-р), } t^{\circ}}$ X₃</p>