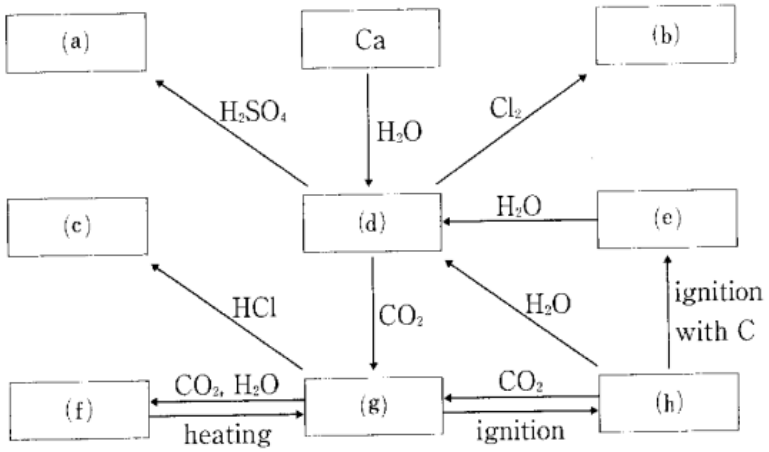
Synthetic Routes:

(1) Inorganic Synthetic Routes

-2008 II

II Give names for the substances (a) to (h). Write the reference number of the correct answer in the answer box.



1) calcium oxide
2) calcium hydroxide
3) calcium sulfate
4) calcium carbide
5) calcium carbonate
6) calcium chloride
7) calcium hydrogencarbonate
8) bleaching powder

-2020 I(7)

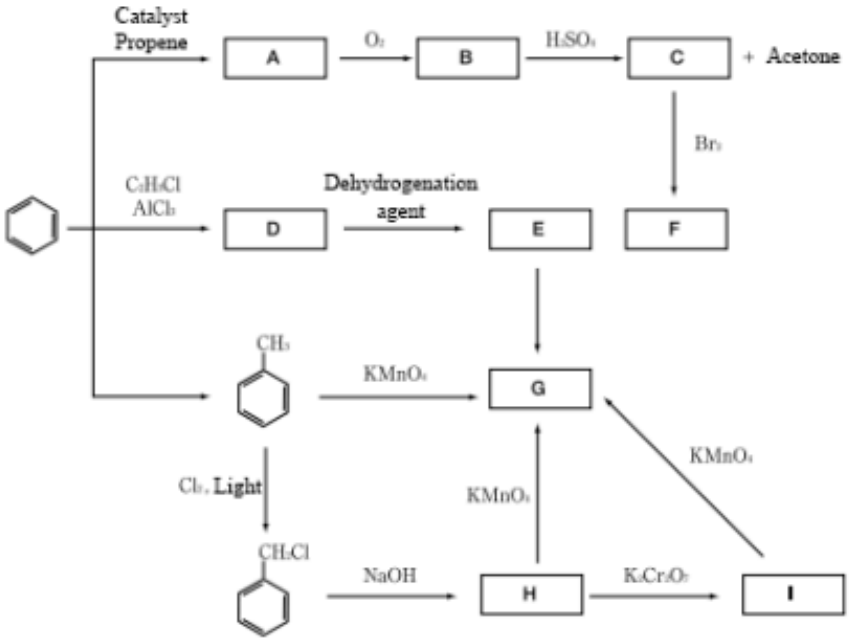
(7) Which of the following descriptions on industrial smelting process is not correct?

1) Sodium is obtained by electrolysis of molten salt.
2) Aluminum is extracted by reducing aluminum oxide with chromium.
3) Iron is extracted by reducing iron oxide with coke.
4) Blister copper is purified by electrolysis refining.

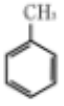
(2) Organic Synthetic Routes

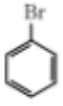
-2006 VI

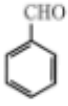
The figure below shows the synthetic routes of different organic compounds. Choose the correct structure formulae for compounds A-I from (1)-(15).

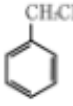


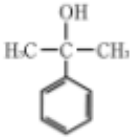
A	B	C	D	E
F	**G**	**H**	**I**	

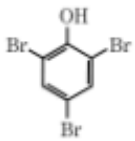
(1) 

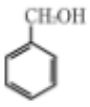
(2) 

(3) 

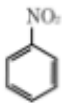
(4) 

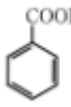
(5) 

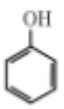
(6) 

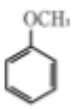
(7) 

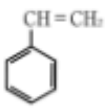
(8) 

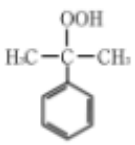
(9) 

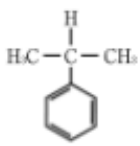
(10) 

(11) 

(12) 

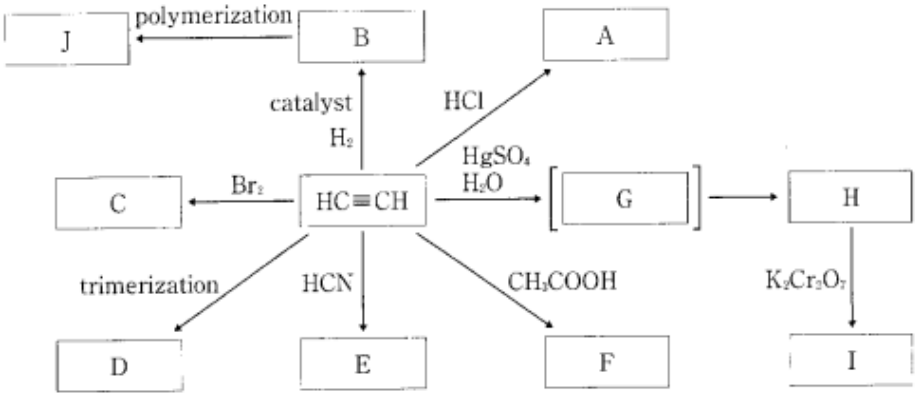
(13) 

(14) 

(15) 

-2008 IV(1)

Ⅳ Outlined here are synthetic processes of organic compounds. Answer the questions (1) to (4)



Question (1) : Select the structural formulas for the compounds A to J from (1)–(20). Compound G is an unstable intermediate.

(1) CH_3CH_2Cl (2) CH_3CH_3 (3) CH_3CH_2CN

(4) $BrHC{=}CHBr$ (5) $\left[CH_2{-}CH_2 \right]_n$ (6) CH_3CHO

(7) CH_3COOH (8) CH_3CH_2Br (9) $BrCH_2CH_2Br$

(10) $H_2C{=}CHC(=O)OCH_3$ (11) $H_2C{=}CHOH$ (12) $H_2C{=}CH_2$

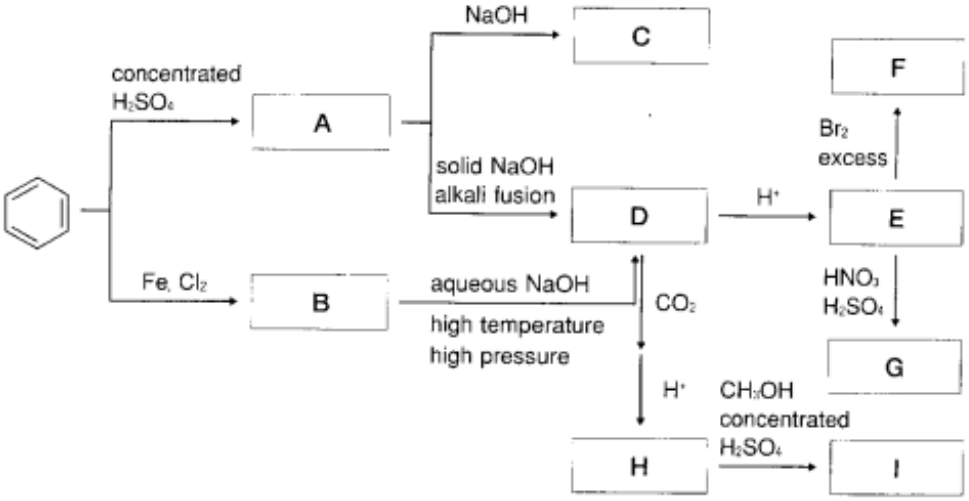
(13) $H_2C{=}CHCN$ (14) CH_3OH (15) $H_3C{-}C(=O){-}CH_3$

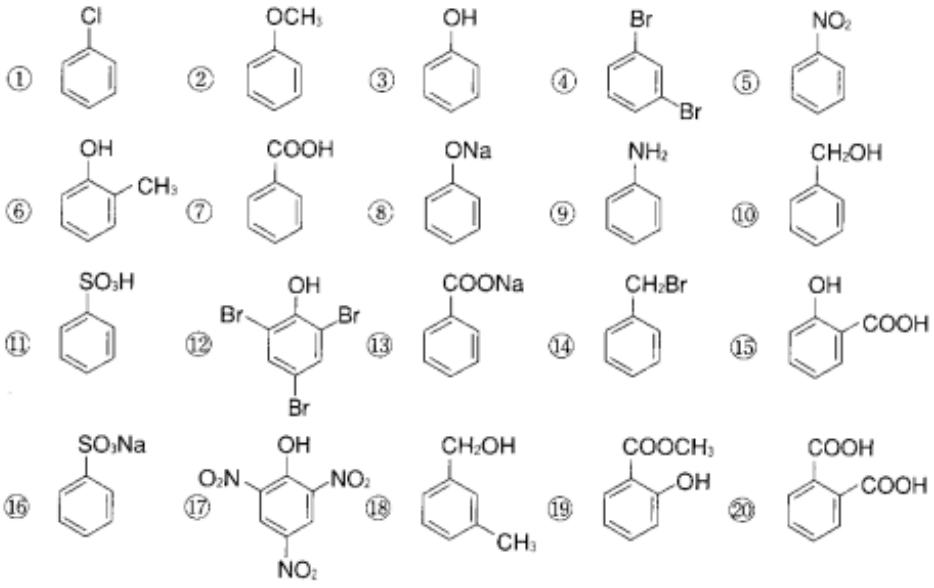
(16) $CH_3CH_2CH_3$ (17)  (18) HCHO

(19) $H_2C{=}CHCl$ (20) $H_2C{=}CHOC(=O)CH_3$

-2009 IV

Ⅳ Outlined here are synthetic processes of some aromatic compounds. Select the structural formulas for the compounds **A** to **I** from ①~⑳.



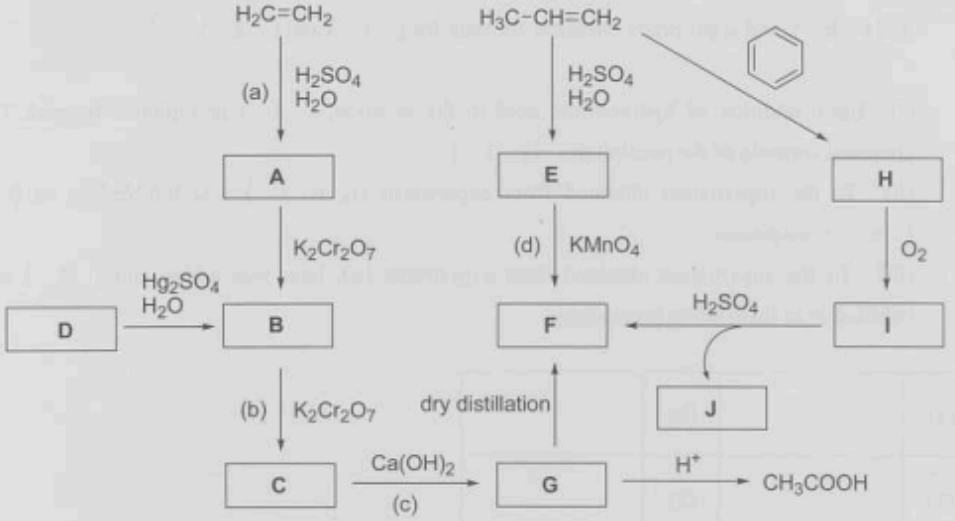


A	B	C	D	E

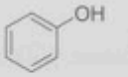
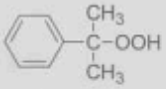
F	G	H	I	

-2012 V

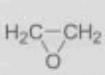
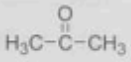
V Outlined here are synthetic processes of organic compounds. Answer the questions (1) and (2).

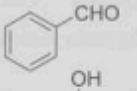
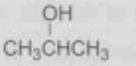
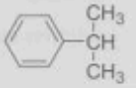


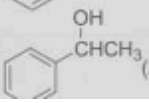
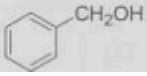
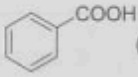
(1) Select the structural formulas for the compounds **A** to **J** from (1)-(25). If necessary, the same number can be used twice.

(1) CH_3CHO (2) CH_3CH_3 (3) CH_3CH_2OH (4)  (5) 

(6) CH_3COOH (7) $(CH_3COO)_2Ca$ (8) CH_3CH_2Br (9) $HOCH_2CH_2OH$ (10) CH_3COOCH_3

(11)  (12) $(CH_3CH_2O)_2Ca$ (13) CaC_2 (14) CH_3OH (15) 

(16) $HC\equiv CH$ (17)  (18) $HCHO$ (19)  (20) 

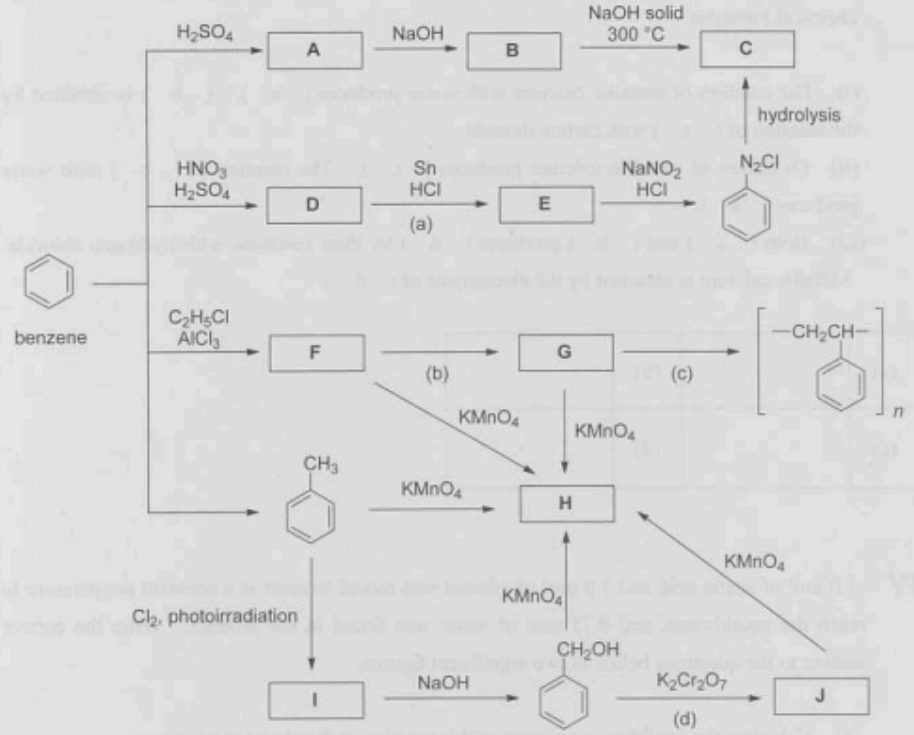
(21) $CH_3CH_2CH_2OH$ (22)  (23)  (24)  (25) $H_2C=CHOCOCH_3$

(2) Looking back at the diagram of synthetic processes of organic compounds shown above, label the types of reactions represented by the letters (a) to (d) from the list (1) to (8). If necessary, the same number can be used twice.

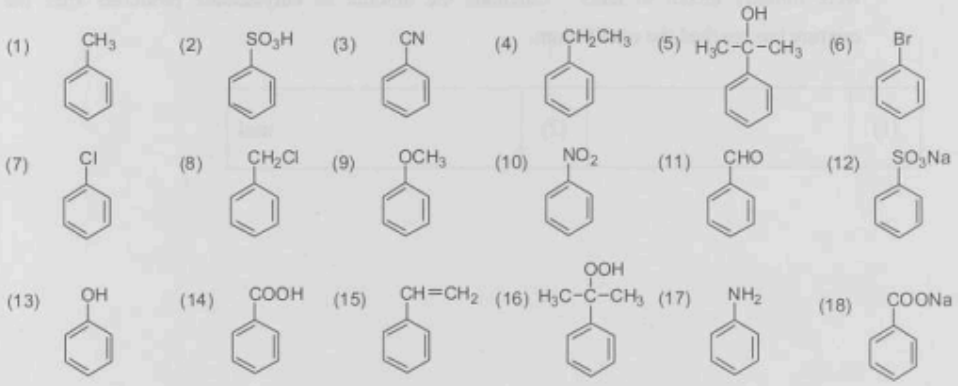
(1) oxidation (2) hydrogenation (3) dehydration (4) addition
(5) addition polymerization (6) substitution (7) decomposition (8) neutralization

-2013 V

V Outlined here are synthetic processes of organic compounds. Answer questions (1) and (2).



(1) Select the structural formulas for the compounds **A** to **J** from (1)-(18).

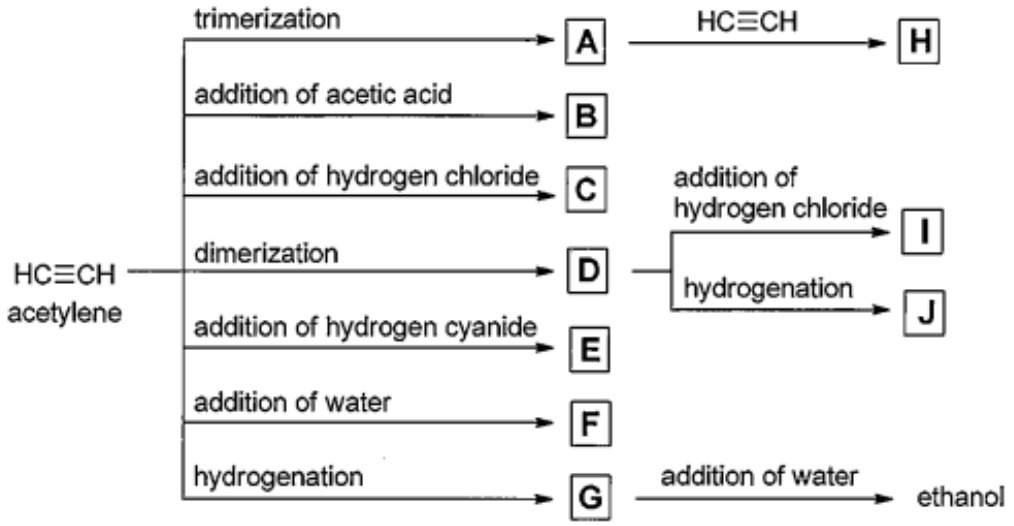


(2) Looking back at the diagram of synthetic processes of organic compounds shown above, label the types of reactions represented by the letters (a) to (d) from the list (1) to (11). If necessary, the same number can be used twice.

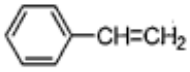
(1) oxidation (2) reduction (3) dehydrogenation (4) addition (5) substitution
(6) dehydration (7) decomposition (8) neutralization (9) addition polymerization
(10) condensation polymerization (11) hydrolysis

-2014 V

V Outlined here are synthetic processes of organic compounds. Select the structural formulas for the compounds **A** to **J** from (1)-(24).



(1) CH_3CH_2Cl (2) $CH_3CH_2OCH_3$ (3) CH_3CH_2CN (4) $BrHC{=}CHBr$ (5) $\left[CH_2{-}CH_2\right]_n$

(6) CH_3CHO (7) CH_3COOH (8) CH_3CH_2Br (9)  (10) $H_2C{=}CHCOCH_3$

(11) $H_2C{=}CH{-}C{\equiv}CH$ (12) $H_2C{=}CH_2$ (13) $H_2C{=}CHCN$ (14) CH_3OH (15) $H_3C{-}C(=O){-}CH_3$

(16) $CH_3CH_2CH_3$ (17)  (18) $H_2C{=}CH{-}C(Cl){=}CH_2$ (19) $H_2C{=}CHCl$ (20) $H_2C{=}CHOCCH_3$ (O above C)

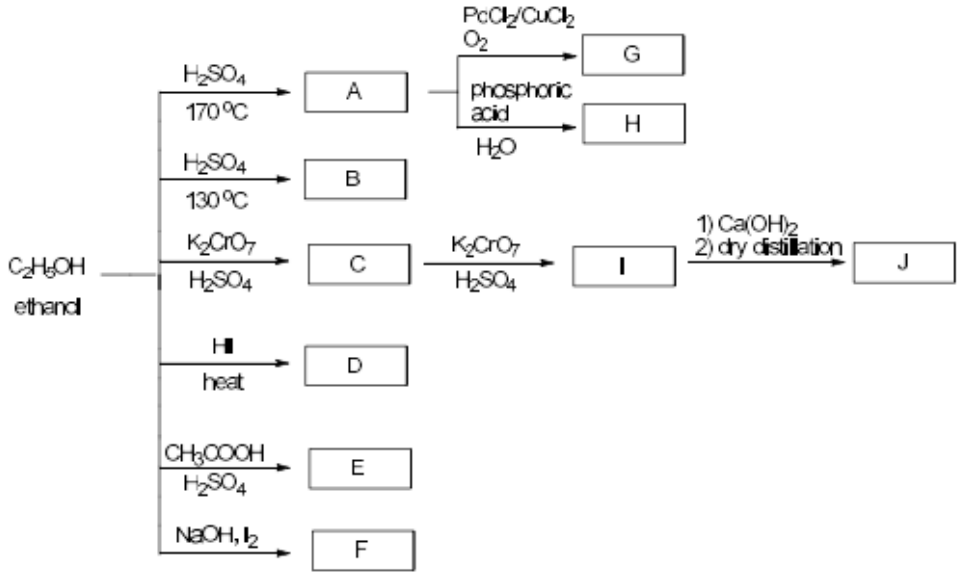
(21) CH_3CH_2OH (22) CH_3CH_2Cl (23) CH_2BrCH_2Br (24) $H_2C{=}CH{-}CH{=}CH_2$

-2015 VI(2)

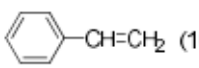
(2) Phenol is industrially produced from the ( ) process. Give the appropriate name of the industrial method.

-2015 VII

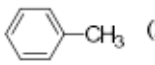
VII Outlined here are synthetic processes of organic compounds. Select the structural formulas for the compounds **A** to **J** from (1)-(24). You may use the same number for an answer several times.



(1) CH_3CH_2Cl (2) $CH_3CH_2OCH_2CH_3$ (3) CH_3CH_2CN (4) $BrHC{=}CHBr$ (5) $\left[CH_2{-}CH_2\right]_n$

(6) CH_3CHO (7) CH_3COOH (8) CHI_3 (9)  (10) $H_2C{=}CHCOOCH_3$

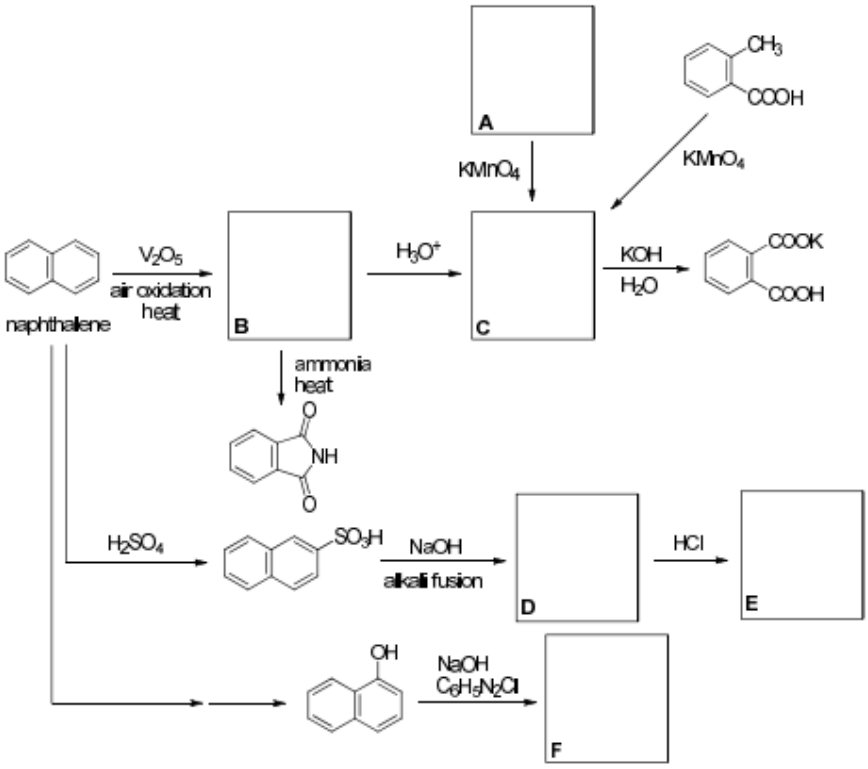
(11) $H_2C{=}CH{-}C{\equiv}CH$ (12) $H_2C{=}CH_2$ (13) $H_2C{=}CHCN$ (14) CH_3OH (15) $H_3C{-}C(=O){-}CH_3$

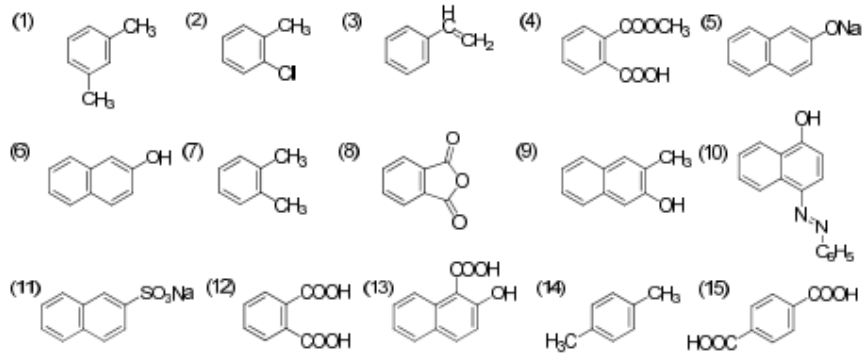
(16) $CH_3CH_2CH_3$ (17)  (18) $H_2C{=}CH{-}C(Cl){=}CH_2$ (19)  (20) $H_2C{=}CHOCCH_3$ (=O)

(21) CH_3CH_2OH (22) CH_3CH_2I (23) $CH_3{-}C(=O){-}OCH_2CH_3$ (24) $HOCH_2CH_2OH$

-2015 V(1)

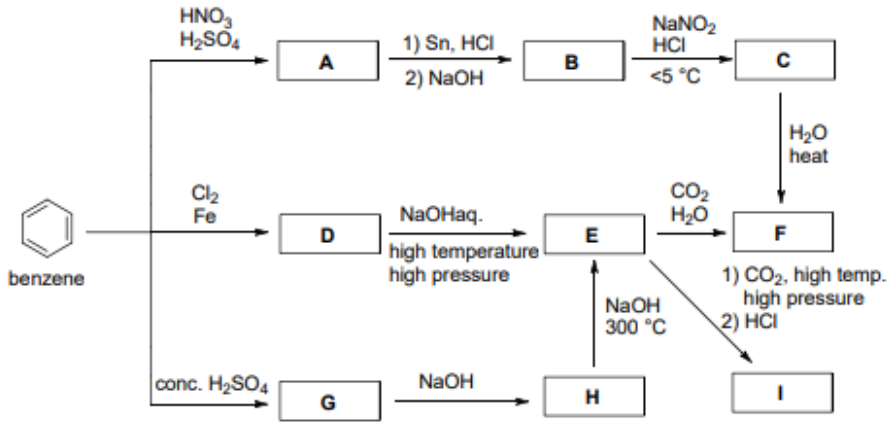
V Outlined here are the synthetic processes of compounds related to naphthalene.



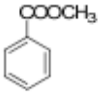


-2017 VI

VI Outlined here are the synthetic processes of aromatic compounds. Select the appropriate structural formulas for the compounds **A** to **I** from (1)-(15).

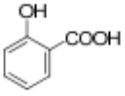


(1) 

(2) 

(3) 

(4) 

(5) 

(6) 

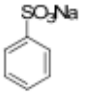
(7) 

(8) 

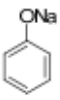
(9) 

(10) 

(11) 

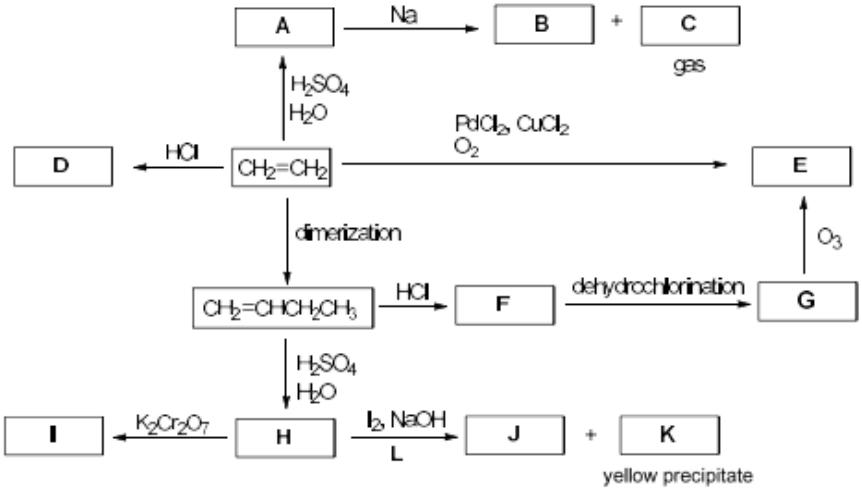
(12) 

(13) 

(14) 

(15) 

V Outlined here are the synthetic processes of organic compounds using ethylene as a starting material.



(1) Select the appropriate structural formulas for the compounds **A** to **K** from 1) to 20).

1) CH_3CH_2Cl 2) CH_3CH_3 3) CH_3CH_2OH 4) $ClCH_2CH_2Cl$ 5) $ClCH_2CH_2OH$

6) CH_3CHO 7) CH_3COOH 8) $CH_2=CHCH_2CH_3$ 9) $CH_3CH=CHCH_3$ 10) HCHO

11) CHI_3 12) N_2 13) CH_3CH_2COONa 14) $CH_3CH_2CH_2CH_2Cl$ 15) $CH_3-\underset{\underset{Cl}{|}}{CH}-CH_2CH_3$

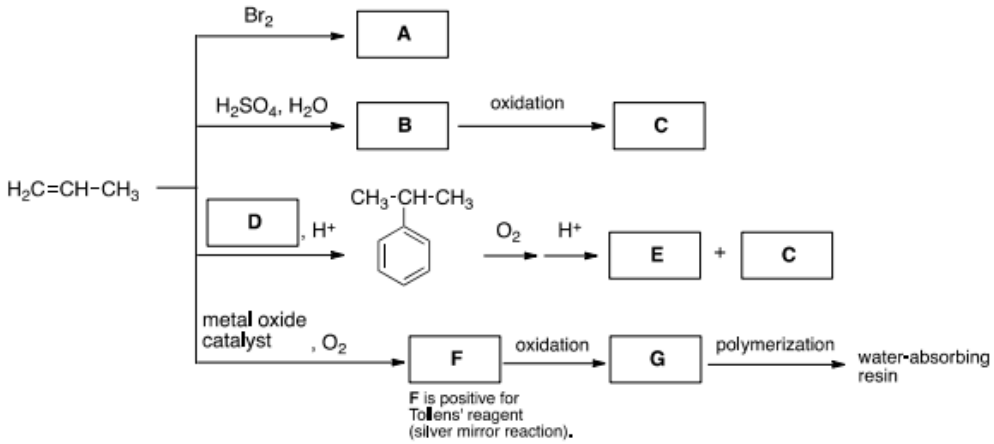
16) CO_2 17) H_2 18) $CH_3-\overset{\overset{O}{\|}}{C}-CH_2CH_3$ 19) CH_3CH_2ONa 20) $CH_3-\underset{\underset{OH}{|}}{CH}-CH_2CH_3$

(2) Select the appropriate name for the reaction **L** from 1) to 5).

1) Iodoform reaction 2) Wacker reaction 3) ozonolysis 4) Fehling test 5) Biuret test

-2019 V(1)

V Outlined here are the synthetic processes of organic compounds using propylene as a starting material.

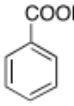


(1) Select the appropriate structural formulas for the compounds **A** to **G** from options 1) to 20).

1) CH_3CH_2Cl 2) HCHO 3) CH_3CH_2OH 4) $H_2C(Br)-CH(Br)-CH_3$ 5) $H_2C(Br)-CH(OH)-CH_3$

6) CH_3CHO 7) CH_3COOH 8) $CH_2=CHCH_2CH_3$ 9) $H_2C=CH-C(=O)-H$ 10) $H_3C-CH(OH)-CH_3$

11) $H_2C=CH-C(=O)-OH$ 12) $H_3C-C(=O)-CH_3$ 13) $CH_3-C(=O)-CH_2CH_3$ 14) $CH_3-CH(OH)-CH_2CH_3$

15) CO_2 16) H_2 17) N_2 18)  19)  20)