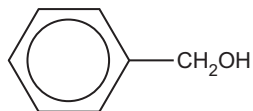
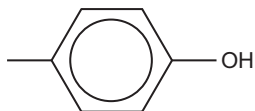


7 Phenylmethanol and 4-methylphenol are isomers.

phenylmethanol



4-methylphenol



(a) Complete Table 7.1 to show the relative acidities of benzoic acid ($\text{C}_6\text{H}_5\text{COOH}$), phenylmethanol, 4-methylphenol and water.

Explain your answer.

Table 7.1

	name of compound

most acidic
↓
least acidic

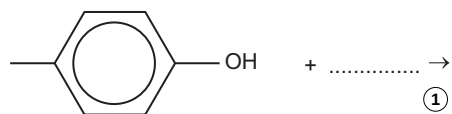
explanation

.....

[4]

(b) 4-methylphenol reacts readily with sodium.

Complete the equation for this reaction.



①

(c) Under certain conditions, ethane-1,2-diol, $\text{HOCH}_2\text{CH}_2\text{OH}$, reacts with propane-1,3-dioic acid, $\text{HOOCCH}_2\text{COOH}$, to form different organic products, as shown in Fig. 7.1.

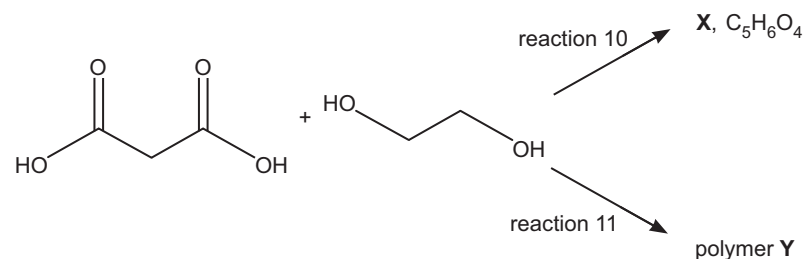


Fig. 7.1

(i) **X** does **not** react with Na metal.

Draw the structure of the organic product **X**, $\text{C}_5\text{H}_6\text{O}_4$, shown in Fig. 7.1.

[1]

(ii) Reactions 10 and 11 in Fig. 7.1 are different types of reaction.

Name the type of reaction for reaction 10 and for reaction 11.

reaction 10

reaction 11

[1]

(iii) Draw a section of polymer **Y** showing only **one** repeat unit.

The new functional group formed should be displayed.

②

[2]