

Chemguide – questions

PHENOL: OTHER REACTIONS

Check to find out exactly what your examiners want you to know about these reactions, and ignore anything not on your syllabus.

- Write the equation for the complete combustion of phenol in oxygen.
 - Why does phenol burn with a smoky flame in air?
- To make the ester ethyl ethanoate, $\text{CH}_3\text{COOC}_2\text{H}_5$, you react ethanol with ethanoic acid. But to make the ester phenyl ethanoate, $\text{CH}_3\text{COOC}_6\text{H}_5$, you wouldn't choose to react phenol with ethanoic acid. Why not?
 - Instead, you can make phenyl ethanoate using phenol and ethanoyl chloride. Write the equation for that reaction.
 - If you did a similar reaction involving phenol and benzoyl chloride, $\text{C}_6\text{H}_5\text{COCl}$, the reaction is too slow, and you have to modify the phenol first to make it more reactive. How do you do that? Write the equation for any reaction you give.
 - Draw the structure for the ester phenyl benzoate. (Use the standard symbol for the benzene ring – the hexagon with the circle inside it.)
 - You can also make esters from phenol in the same sort of way using an acid anhydride such as ethanoic anhydride rather than an acid chloride, but in this case, you usually modify the phenol first in the way you should have described in part (c) above. Why?
- Describe how you would test for phenol using iron(III) chloride solution.