

Chemguide – questions

ACID ANHYDRIDES: REACTIONS WITH AMMONIA AND PRIMARY AMINES

1. Reactions of acid anhydrides with these compounds involve two stages. In the first, there is a reaction between the anhydride and ammonia or the amine, and in the second there is a further reaction involving ammonia or the amine with one of the products of the first reaction.

In each of the following cases, write the equation for

- (i) the reaction between the named compound and ethanoic anhydride,
- (ii) the second reaction involving one of the products,
- (iii) the overall reaction.

You can use simplified structural formulae such as $(\text{CH}_3\text{CO})_2\text{O}$ and $\text{C}_6\text{H}_5\text{NH}_2$ if you wish, but if you find it helps to use more detailed structures, then use them.

Write equations as above for the reaction between ethanoic anhydride, $(\text{CH}_3\text{CO})_2\text{O}$, and

- a) ammonia, NH_3
- b) methylamine, CH_3NH_2
- c) phenylamine, $\text{C}_6\text{H}_5\text{NH}_2$