

Solutions

Each answer shows the steps, then the **result**.

2.1

- the $\text{N}\equiv\text{N}$ triple bond is very strong (high bond energy); the molecule is non-polar / symmetrical

2.2

- $\text{NH}_3 + \text{H}^+ \rightarrow \text{NH}_4^+$

3.1 B

- The lone pair on nitrogen accepts a proton

3.2 B

- $2\text{NO} + 2\text{CO} \rightarrow \text{N}_2 + 2\text{CO}_2$

3.3

(a)

- the high temperature in the engine makes nitrogen and oxygen from the air react;
 $\text{N}_2 + \text{O}_2 \rightarrow 2\text{NO}$

(b)

- directly: NO_2 dissolves in rain to form nitric acid; as a catalyst: NO_2 catalyses the oxidation of SO_2 to SO_3 , which forms sulfuric acid in the rain

3.4

- warm the salt with sodium hydroxide; ammonia gas is given off — sharp smell and damp red litmus turns blue