

Q1.

(a) Suggest products for the reaction of Li_3N with water. Write a balanced equation for the reaction.

(b) A compound **A** was isolated from the reaction between a group 1 metal **M** and O_2 . **A** reacts with water to give only MOH , while **M** reacts in a controlled manner with water giving MOH and another product, **B**. Suggest identities for **M**, **A** and **B**. Write equations for the reactions described. Compare the reaction of **M** with O_2 with those of the other group 1 metals with O_2 .

Q2.

By considering **Fig. A** and the packing of the units shown into an infinite lattice, show that

(a) the ratio of $\text{Li}^+ : \text{N}^{3-}$ ions in **layer 2** is 2:1, and

(b) The stoichiometry of the compound is Li_3N .

