

The Chemistry of the Elements (Dr. Draper)

JF Science and Pharmacy Tutorial Sheet

1. Define **three** of the following terms. Provide examples for each and discuss their importance in chemistry.

- (i) Lewis acid
- (ii) saline hydride
- (iii) isotope
- (iv) hydrogen bonding

2. Describe giving equations the Bayer and Hall processes which are used in the industrial extraction and purification of alumina from its ore.

Your answer should include:

- (i) the importance of the formation of a soluble aluminate ion in the purification of alumina.
- (ii) Environmental reasons for the recycling of aluminium products.

3. Complete **three** of the following, predicting the products and providing balanced equations. Explain your reasoning.

- (i) $2 \text{Na(s)} + \text{O}_2\text{(g)} \longrightarrow$
- (ii) $\text{SiO}_2\text{(s)} + 2 \text{Na}_2\text{CO}_3\text{(s)} \xrightarrow{770\text{K}}$
- (iii) $\text{Sn(s)} + 2 \text{H}_2\text{O(l)} + 2 \text{NaOH(aq)} \longrightarrow$
- (iv) $\text{Xe} + 3\text{F}_2\text{(g)} \longrightarrow$

4. Writes brief notes on

- (i) the halogens as oxidising agents
- (ii) the use of KO_2 and KOH in breathing apparatus.
- (iii) the chemical properties of sulfuric acid