

TRAVAUX DIRIGES UE CHM 221_2024-2025

SÉRIE 4 : L'HYDROGENE- LES ELEMENTS DES GROUPES 1 ET 2

Exercise 1.

Indicate which of these elements are likely to form ionic, covalent or metallic hydrides: Sr, Si, O, Li, B, Be, Pd and Al

Exercise 2.

In which of the following mixtures of solvents will there be intermolecular hydrogen bonding between the different solvent molecules? Give diagrams to show the likely hydrogen-bonded interactions.

a) Et₂O and THF

b) EtOH and H₂O

c) EtNH₂ and Et₂O

Exercise 3.

- a) Dire si les solutions aqueuses suivantes sont acides, basiques ou amphotères : Li₂O, Na₂O, CsO₂
- b) Predict the products of the reaction of :
 - i) an alkyl chloride with lithium metal
 - ii) rubidium with oxygen

Exercise 4

Prédire les produits des réactions suivantes et équilibrer les équations :

- a) $\text{Sr(s)} + \text{O}_2(\text{g}) \rightarrow$
- b) Décomposition thermique de $\text{CaCO}_3(\text{s})$
- c) $\text{CaC}_2(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow$
- d) $\text{RbHCO}_3(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow$

Exercise 5

A sample consisting of 20.35 g of finely divided calcium metal is allowed to react completely with nitrogen. What is the mass of the product?

Exercise 6.

A group 2 metal **M**, dissolves in liquid NH₃, and from the solution, compound **A** can be isolated. **A** slowly decomposes to **B** with liberation of NH₃ and a gas **C**. Metal **M** gives a crimson flame test; through blue glass, the flame appears pale purple. Suggest identities for **M**, **A**, **B** and **C**.