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Tutorial N°1. Cement

Exercice 1

Using **Bogue Equations** calculate the proportions of the four main minerals in Clinker (Alite, Belite, Aluminate, Ferrite).

Exercice 2

- What is the difference between **Clinker** and **Cement** ?
- Give the composition of the **Clinker**.
- What is the chemical structure of **Gypsum** ?
- What is the compound responsable for sea water and salt resistant ?

Exercice 3

The chemical composition of a sample of **Cement** are as the following :
(Loss 0.81%, SO_3 2.73%, MgO 0.79%, Fe_2O_3 3.11%, Al_2O_3 4.74, SiO_2 23.44%, CaO 64.74).
Calculte the weight % for the following compounds.

1. The compound which responsable for the setting of Cement (C_3A).
2. The compound which responsable for sea water and salt resistant (C_4AF).

Give : M_{Al} = 26.98 g/mol, M_{Ca} = 40.08 g/mol, M_O = 216.00 g/mol, M_{Fe} = 55.85 g/mol, M_{Si} = 28.09 g/mol

Exercice 4

The % coposition by mass of sample of **Clinker** is :
CaO : 64.5 SiO_2 23.4 Al_2O_3 : 4.5 Fe_2O_3 : 3.1 MgO : 0.8 Loss : 3.7
Calculte the % by mass for the following compounds :

1. The compound that responsable for the setting of the Clinker.
2. The compound that responsable for sea water resistance.
3. The compound that responsable for the final strength.

Give : M_{Al} = 26.98 g/mol, M_{Ca} = 40.08 g/mol, M_O = 216.00 g/mol, M_{Fe} = 55.85 g/mol M_{Si} = 28.09 g/mol