

Chapter 1

Ore Minerals

1.1. Types of Ore Mineral

In a hydrometallurgical process leaching of a metal from an ore is carried out at a relatively low temperature, below about 200°C. The rate of reaction may be slow and will depend on the nature of the phase containing the metal. For example under acidic oxidizing conditions copper is dissolved very much more rapidly from chalcocite, Cu_2S , than it is from chalcopyrite, CuFeS_2 . Therefore in a hydrometallurgical process, the nature of the minerals present is important whereas when a copper sulphide concentrate is fed into a smelter this is not the case.

The type of process used to recover a metal from an ore depends on the chemical nature of the mineral containing it. Many minerals are treated in hydrometallurgical processes but there are few classes of such minerals. They are shown, with some examples, in Table 1.1.

1.2. Types of Crystal Lattice

1.2.1. *Introduction*

Textbooks on physical chemistry give accounts of crystal chemistry and specialist texts are available such as that of Wells.¹ These should be consulted for information concerning the arrangements of atoms or ions in the different