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Cu-Fe sulphides: a comparison of natural and synthetic material

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Cu-Fe sulphides have been an extensive field of research in the last century and their structure and composition are well known. Until today there has not been a detailed comparison of natural and synthetic Cu-Fe sulphides. Except Chalcopyrite there are also some exotic minerals like Mooihoekite (Cu9Fe9S16), Talnakhite (Cu9Fe8S16) and Haycockite (Cu8Fe10S16). Our studies report the results of a comparison of natural and synthetic Cu-Fe sulphides and if these exotic minerals can be found in natural chalcopyrite. Therefore seventeen natural samples from different localities and three synthetic samples with a stoichiometric and two with a non-stoichiometric composition are studied. First the microprobe is used to determine the textural context and the chemical composition. In a further step XRD measurements and a Rietveld refinement are applied to obtain structural parameters and quantitative analyses of the samples. Our contribution will give a summary on similarities and differences between natural and synthetic compounds.