

THEERACHOK MOOKDEE : MINERALOGICAL STUDY AND SEPARATION OF COLUMBITE
-TANTALITE FROM WOLFRAMITE BY CHEMICAL LEACHING. THESIS ADVISOR :
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Purposes of this research are to study mineralogy and to separate columbite-tantalite from wolframite by chemical leaching. Samples are from tin dressing plant of Roong Aroon Ta Kuapa, Amphoe Ta Kuapa, Phangnga Province.

Mineralogically the samples comprise 26.3 % columbite-tantalite, 28.0 % wolframite, 20.4 % ilmenite, 14.7 % coronadite and 8.6 % of other minerals mainly monazite, xenotime, quartz, cassiterite, zircon, quartz interlocking wolframite. Sample grain sizes are less than 100 mesh with chemical compositions of 6.60 % Nb_2O_5 , 4.36 % Ta_2O_5 , 14.02 % WO_3 , 12.15 % Fe_2O_3 , 18.75 % MnO , 14.42 % TiO_2 and 4.35 % PbO .

Samples are ground to -200 mesh for effective leaching. The experiments are carried out by varying the concentration of NaOH and HCl , % solid, temperature, rate of agitation and leaching time.

Optimum conditions obtained by NaOH leaching are as follows : 10 N NaOH , 10 % solid, 90 °C, 80 % agitation and 5 hours of leaching time. The residue after leaching contains columbite-tantalite, wolframite, ilmenite and coronadite with chemical composition of 7.68 % Nb_2O_5 , 5.18 % Ta_2O_5 , 2.45 % WO_3 , 12.31 % Fe_2O_3 , 29.75 % MnO , 14.83 % TiO_2 and 4.55 % PbO .

Optimum conditions obtained by HCl leaching are as follows : 10 N NaOH , 10 % solid, 90 °C, 80 % agitation and 5 hours of leaching time. The residue after leaching contains columbite-tantalite, wolframite and ilmenite with chemical composition of 16.89 % Nb_2O_5 , 11.19 % Ta_2O_5 , 3.81 % WO_3 , 13.41 % Fe_2O_3 , 7.38 % MnO and 26.28 % TiO_2 .