



## Determination of rare earth elements in the decomposition process of Thai monazite ore samples by wavelength dispersive X-ray fluorescence

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Wavelength dispersive X-ray fluorescence (WDXRF) was used to determine rare earth elements in the decomposition process of Thai monazite ore samples because of incomplete digestion and spectral interference problems in ICP-OES analyses. The monazite ore was decomposed by alkali method and then the rare earth was extracted to CeO<sub>2</sub>, final product. In this study, the analyzed samples composed of raw material (monazite ore), intermediate (mixed rare earth hydroxide, RE(OH)<sub>3</sub>) and CeO<sub>2</sub>. The different solid sample preparations (a loose powder, a pressed powder pellet and a fused bead) were investigated. The amounts of sample and binder were studied for the pressed pellet method including 20-80 wt%. For fused bead method, the amounts of sample and fluxing agent were investigated including 9-24 wt%. The results obtained by the pressed pellet method were in good agreement with those obtained by the fused bead method for all samples. The pressed pellet method with an acceptable relative standard deviation was considered to be more efficient compared to the loose powder and fused bead method. Cerium oxide was found to be predominant in those samples. The percentages of cerium oxide in raw material, intermediate and final product samples were 30.31%, 64.44% and 99.67%, respectively when measured by pressed pellet method using the optimum amounts of samples of 40%, 60%, and 20%, respectively.

**Keywords:** Rare earth elements; Monazite ore; WDXRF