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## **SYNTHESIS OF $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ BY MODIFIED SOL-GEL METHOD WITH HYDROTHERMAL**

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$\text{CaCu}_3\text{Ti}_4\text{O}_{12}$  powders were synthesized by modified Sol-gel method with Hydrothermal using  $\text{Ca}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ ,  $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$ ,  $\text{Ti}(\text{OC}_3\text{H}_7)_4$  and freshly extracted egg white (ovalbumin) in aqueous medium. The precursor was calcined at 800, 900 and 1000 °C in air for 8 h to obtain nanocrystalline powders of  $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ . The calcined  $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$  powders were characterized by XRD, TEM, and EDX. The XRD results indicated that all calcined samples have a typical perovskite  $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$  structure and a small amount of  $\text{CaTiO}_3$ ,  $\text{CuO}$  and  $\text{TiO}_2$ . TEM micrographs showed particle size 100 –500 nm and EDX results showed elements of  $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$  powders have calcium, copper, titanium and oxygen.

**Author:** Dr MASINGBOON, Chivalrat

**Co-author:** Mr RUNGRUANG, Sirisak

**Presenter:** Dr MASINGBOON, Chivalrat

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