**Research Title** The investigation of microstructure and magnetic property of Magnesium Manganese Ferrite ($Mg_{(1-x)}Mn_xFe_2O_4$) ceramics prepared by co-precipitation method and two-step sintering.

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## ABSTRACT

This research was carried out to study microstructure and magnetic property of magnesium manganese ferrite ($Mg_{(1-x)}Mn_xFe_2O_4$). The mixed ceramics were prepared by co-precipitation method and two-step sintering with different x ratio of x = 0.5, 0.6 and 0.7 at a calcination temperature of 1,100 $^{\circ}$C. The two-step sintering was carried out by comparing sintering temperature of $T_1$ ranging from 1,250-1,450 $^{\circ}$C and sintering temperature of $T_2$ at 1,200 $^{\circ}$C. The ceramics structure determined by X-ray diffraction revealed that it was cubic spinel. Microstructure of ceramics determined by scanning electron microscope, revealed that the grain was polygonal and irregular in size. All samples showed ferromagnetic properties which were determined by Vibrating sample magnetometer (VSM). The study on physical characteristics of $Mg_{0.4}Mn_{0.6}Fe_2O_4$, revealed that the grain is square and the density of sample not different in each sintering temperature. The results of magnetic property of $Mg_{0.4}Mn_{0.6}Fe_2O_4$ sintered with $T_1$ at 1,300 $^{\circ}$C show the ferromagnetic properties and maximum magnetic field constant value was 6.001 emu/g