

# Effects of Ni doping on structural and magnetic properties of copper ferrite

Zbigniew S. Piskula,<sup>1</sup> Jolanta Darul,<sup>1</sup> Tomasz Toliński,<sup>2</sup> and Waldemar Nowicki<sup>1</sup>

<sup>1</sup>*Faculty of Chemistry, Adam Mickiewicz University, Poznań, Poland*

<sup>2</sup>*Institute of Molecular Physics, Polish Academy of Sciences, Poznań, Poland*

The aim of this work was to obtain more information about the influence of small quantities of Ni<sup>2+</sup> ion on the structural and magnetic properties of the tetragonally distorted of Cu<sub>1-x</sub>Ni<sub>x</sub>Fe<sub>2</sub>O<sub>4</sub>. A series of ferrite samples of the chemical composition Cu<sub>1-x</sub>Ni<sub>x</sub>Fe<sub>2</sub>O<sub>4</sub> (with x = 0.0; 0.05; 0.1 and 0.15) prepared by the combustion method using citrate-nitrate precursors. The samples underwent a successive thermal treatment in air 300, 600, and 900°C for 4 hours. After heating, the preparations were either cooled slowly to the room temperature. Structural analysis results for tetragonal copper ferrite indicated that above 360°C a part of copper ions moves into the tetrahedral sites and structural tetragonal (*I4<sub>1</sub>amd*) → cubic (*Fd3m*) phase transition appears. Substitution with small quantities of nickel ions clearly decreases the temperature of structural transformation for Cu<sub>1-x</sub>Ni<sub>x</sub>Fe<sub>2</sub>O<sub>4</sub> system. The obtained result indicates that the distribution of cations has a great influence on the structural and magnetic properties of the modified copper ferrites.