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Evolution of crystallization and magnetic phase transition in Cu1-xZnxFe2O4 studied by neutron powder diffraction. FENFEN CHANG, China Spallation Neutron Source, Dongguan, Guangdong Province, MAXIM AVDEEV, GUOCHU DENG, JAMES HESTER, The Bragg Institute, Australian Nuclear Science and Techonology Organisation, Lucas Heights, NSW 2234, Australia, XIAOLIN WANG, Institute for superconducting and electronic materials, University of Wollongong, NSW 2500, Australia, CLEMENS ULRICH, The School of Physics, The University of New South Wales, Sydney NSW 2052, Australia — High resolution and high intensity neutron powder diffraction were applied to study the crystallographic and magnetic phase transition in Cu1-xZnxFe2O4 from 4 K to 750 K. Structural phase transition from cubic to tetragonal phase was observed in CuFe2O4. Ferrimagnetic order was observed in CuFe2O4 and short-range antiferromagnetic scattering was observed below 10 K in cubic ZnFe2O4 which is strongly restrained by addition of slightly amount of Cu2+ ions. Upon doping, ferromagnetic order temperature was gradually reduced from 789 K. Collinear spin setting was observed and no indication of frustration was found even up to doping rate of x = 0.6. Highly frustrated Cu0.04Zn0.96Fe2O4 and ZnFe2O4 behave short-range antiferromagnetic order, induced by the competing between ferromagnetic interaction from first-nearest neighbor and antiferromagnetic interaction from the third-nearest neighbor in tetrahedron formed by Fe ions on B sites.

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