New structural phase transition in Bi$_2$(Fe$_{4-x}$Mn$_x$)O$_{10-x}$ complex oxides and its implications in the mullite family of materials$^1$ PATRICIA KALITA, ANDREW CORNELIUS, HiPSEC & Dept. of Physics and Astronomy, University of Nevada Las Vegas, Las Vegas, NV, USA, STANISLAV SINOGEIKIN, Geophysical Lab., Carnegie Institution of Washington, Washington, DC, USA, KRISTINA LIPINSKA, OLIVER HEMMERS, Harry Reid Center for Environmental Studies, University of Nevada Las Vegas, NV, USA, MICHAEL LUFASO, ZACHARY KANN, Dept. of Chemistry, University of North Florida, Jacksonville, FL, USA, HARTMUT SCHNEIDER, Inst. of Crystallography, University of Koeln, Koeln, Germany — Complex oxides with the mullite crystal structure belong to the most important phase in both traditional (porcelains and aluminosilicate refractories) and advanced ceramics (heat exchangers, shock resistant composites, optical devices). New complex oxides in the mullite family Bi$_2$(Fe$_{4-x}$Mn$_x$)O$_{10-x}$ were synthesized and characterized. Using synchrotron x-ray diffraction we demonstrate a new structural phase transition in Bi$_2$(Fe$_{4-x}$Mn$_x$)O$_{10-x}$ induced by pressure. We contrast it with the structural stability for mullite senso stricto Al$_{4+2x}$Si$_{2-2x}$O$_{10-x}$ where we did not observe any phase transition.

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