

Phase transformations in mechanically activated Jahn-Teller systems

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Abstract

It has been shown that using the theory of John-Teller cooperative effect, we can explain the phenomena caused by mechanical activation of oxides of the system Mn-O:

- narrowing the stability zone of cooperative John-Teller (JaT) phase of hausmannite γ -Mn₃O₄;
- disappearance of the indicated phase at the grain sizes of the order 10 nm (with the temperature increase Mn₂O₃ phase is restored directly to the spinel phase β -Mn₃O₄);
- substantial reduction, as compared to large grain samples, of the temperature of transition from metastable (at low temperatures) JaT phase in β -Mn₃O₄ to stable α -Mn₂O₃ on heating of mechanically activated (nanosized) Mn₃O₄ oxide.