Abstract Submitted
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Study of the structure and oxygen storage/release capacities of $\mathbf{Dy_{1-x}Y_xMnO_{3+\delta}}$ $\mathbf{(0 \leq x \leq 1)}$[1] STEVEN REMSEN, BOGDAN DABROWSKI, OMAR CHMAISSEM, STANISLAW KOLESNIK, JAMES MAIS, Northern Illinois University, DeKalb, IL 60115, NIU LABORATORY FOR MATERIAL DESIGN TEAM — Synthesis, oxygen storage/release capacities (OSC), oxygen absorption/desorption rates, and preliminary structural properties of $Dy_{1-x}Y_xMnO_{3+\delta}$(0 $\leq$ x $\leq$ 1) have been studied by x-ray and neutron powder diffraction, dilatometry, and thermogravimetric analysis. This system has been found to have excellent reversible OSC at low-temperatures of 200 - 375 $^\circ$C and oxygen content of these structures have also been found to be sensitive to changes of partial-pressures of oxygen in this low-temperature range, making them potential candidates for oxygen sorbents in novel gas separation methods such as thermal swing absorption and thermal-automatic recovery processes. The OSC of the $Dy_{1-x}Y_xMnO_{3+\delta}$system relies on the difference in oxygen content of a reversible phase transition between hexagonal $P6_3cm$ ($\delta = 0$) and a previously unreported phase of this system ($\delta =$ 0.25, currently under investigation) and pyrochlore Fd3m ($\delta = 0.50$, Subramanian et al. J. Solid State Chem. 72 (1988) 24).

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