

### Synthesis of Carbonate Crystals using for Oxygen Separation

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Air separation is required for the production of pure oxygen in the oxy-fuel combustion. Cryogenic air separation has been used for the large-scale air separation but requires high energy consumption. Nitrogen-selective adsorptive air separation is not suitable for the large-scale oxygen production and has poor selectivity in separation. However, oxygen-selective adsorptive air separation has advantages such as reduced operation cost and high productivity and therefore may replace the conventional cryogenic process even for large-scale production. The barium oxide is highly applicable as an oxygen-selective sorbent to air separation via a reversible oxidation reaction. Due to high reactivity of barium ion, the barium oxide crystals should be stabilized with an additive. In this study, we prepared carbonate crystals with an additive by different methods and verified the formation mechanism of the carbonate crystals by recrystallization process using SEM, powder XRD, and other spectroscopy tools.