

# Amino Acid-aided Synthesis of High Surface Area Hexagonal SrMnO<sub>3</sub> Catalyst for Aerobic Oxidation

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Perovskite-type oxides have attracted much attention in broad fields because of their versatility and accessibility. In order to synthesize high surface area nanoperovskites as effective catalysts, many efforts have been made. However, the development of simple and efficient methods to obtain highly homogeneous and dispersed perovskites with high surface area is still strongly required. Our group has recently reported that hexagonal SrMnO<sub>3</sub> (SMO) with a surface area of 25 m<sup>2</sup> g<sup>-1</sup> synthesized by the polymerized complex method can act as efficient heterogeneous catalyst for the selective liquid-phase aerobic oxidation of various substrates.<sup>[1]</sup> Further increase in surface area of SMO improve its catalytic activity. In this study, the simple and efficient synthetic method for preparing nanoperovskites with high surface area was investigated by focusing on the formation of an amorphous precursor.

At first, the synthesis of high-surface-area SMO was attempted by a hydroxyl acid-aided method using *nitrate salts* that are commonly used as metal sources in sol-gel synthesis.<sup>[2]</sup> However, this was unsuccessful because the precursor from the metal *nitrates* contained only crystalline Sr(NO<sub>3</sub>)<sub>2</sub> and pure SMO was not formed by calcinations even at 1223 K. To accelerate the ligand exchange reactions, the metal sources were changed from *nitrates* to *acetates*. The precursor prepared from aspartic

acid and metal acetates was completely amorphous and high-surface-area SMO was successfully synthesized by calcination of the amorphous precursor. Since the precursor with relatively low carbon contents are readily decomposed, pure SMO could be obtained even at lower calcination temperatures (by 100–400 K). The specific surface area reached up to 47 m<sup>2</sup> g<sup>-1</sup> and this value is much larger than those (2–25 m<sup>2</sup> g<sup>-1</sup>) for SMO synthesized by reported methods.

The catalytic activity for heterogeneous liquid-phase oxidation with O<sub>2</sub> was significantly improved compared with SMO prepared by the polymerized complex method. The present catalytic system was applicable to the oxidation of various substrates.

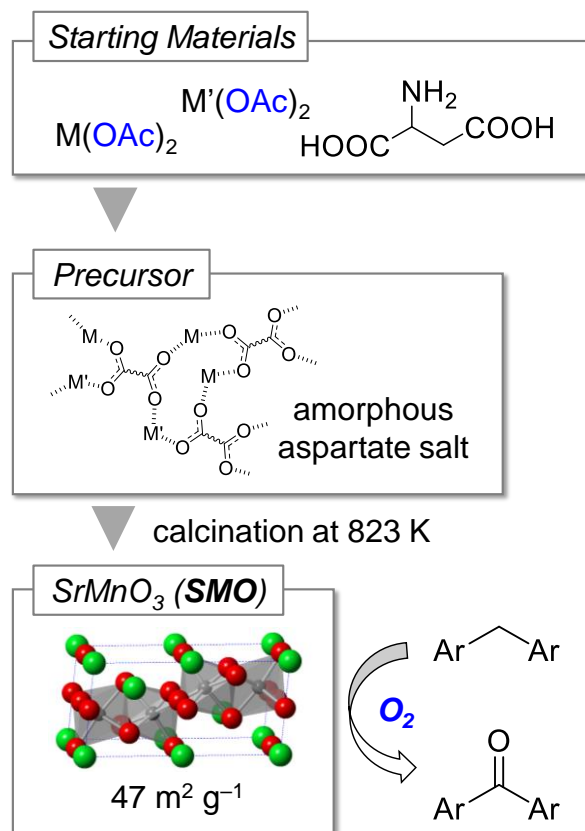


Fig.1 Synthetic scheme of SMO catalyst for aerobic oxidation.

## REFERENCES

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