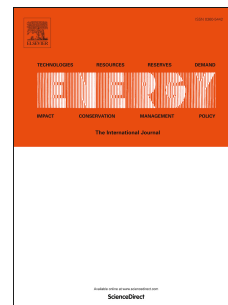


# Accepted Manuscript

Sm<sub>2</sub>O<sub>3</sub> embedded in nitrogen doped carbon with mosaic structure: An effective catalyst for oxygen reduction reaction

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1            **Sm<sub>2</sub>O<sub>3</sub> embedded in nitrogen doped carbon with mosaic**  
2            **structure: an effective catalyst for oxygen reduction reaction**

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8            **Abstract:**

9            Exploring non Pt-based catalysts with high ORR performance still remains a  
10           great challenge in the development of energy conversion and storage devices. The aim  
11           of this study is preparing a novel ORR catalyst (Sm<sub>2</sub>O<sub>3</sub> embedded in nitrogen doped  
12           carbon by calcination processes, named as Sm<sub>2</sub>O<sub>3</sub>-CN-1100) to substitute Pt catalysts.  
13           And the results of this study show that Sm<sub>2</sub>O<sub>3</sub>-CN-1100 displays good electrocatalytic  
14           activity towards ORR, with high stability, strong tolerance to methanol crossover, and  
15           a quasi 4-electron transfer process, making it a promising Pt alternative ORR catalyst.  
16           The satisfactory ORR performance would result from the mosaic structure of Sm<sub>2</sub>O<sub>3</sub>  
17           embedded in nitrogen doped carbon layer and the strong coupling effect between  
18           Sm<sub>2</sub>O<sub>3</sub> and nitrogen doped carbon.

19           **Key words:** Sm<sub>2</sub>O<sub>3</sub>; Polyaniline; Nitrogen doped carbon; Mosaic structure; Oxygen  
20           reduction reaction

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