

## O<sub>2</sub>存在下NO在固体电解质电池上分解机理

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**摘要** 研究了在O<sub>2</sub>存在条件下, NO在Pd|YSZ|Pd固体电解质电池和RuO<sub>2</sub>|Pd|YSZ|Pd固体电解质电池上的分解性质,在O<sub>2</sub>存在条件下650~700℃之间,在0~4.4V直流电压作用下,NO在Pd|YSZ|Pd电池和RuO<sub>2</sub>|Pd|YSZ|Pd电池上的分解不以电解机制进行,而以电催化机理进行的。即在直流电压下,阴极催化剂上的O<sub>2</sub>(2-)被直流电压通过YSZ固体电解质转移到阳极,以O<sub>2</sub>的形式放出,以此保持催化剂的活性状态。在Pd|YSZ|Pd固体电解质电池上,Pd金属表面是催化NO分解的主要活性位。RuO<sub>2</sub>|Pd|YSZ|Pd固体电解质电池上,某特定还原态的RuO<sub>x</sub>(0<x<2)是NO分解的主要活性位。在O<sub>2</sub>存在下,该电池在1~4V间合适的电压下,在650~700℃能选择性地对NO进行电催化分解。

**关键词** [电催化](#) [一氧化氮](#) [分解](#) [电解质](#) [氧化钌](#) [铂](#) [电解](#)

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## The Mechanism of NO Decomposition on the Solid Electrolyte Cell in the Presence of O<sub>2</sub>

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**Abstract** The properties of RuO<sub>2</sub>|YSZ|Pd cell and Pd|YSZ|Pd cell for NO decomposition in the presence of O<sub>2</sub> were studied. The results have proved that, the NO was decomposed via the electrocatalysis mechanism other than electrolysis mechanism at the reaction temperature between 650~700℃ on the both cells at applied voltages in the range of 1~4V. Namely, the O<sub>2</sub>(2-) produced from NO decomposition and ionization of O<sub>2</sub> on the surface of the cathode was transported through YSZ to the anode by DC voltage and then given off in the form of O<sub>2</sub> so as to maintain the active states of the cathode and the catalyst being coated on the cathode. On the Pd|YSZ|Pd cell, the palladium metal surface is the active site for NO decomposition and on the RuO<sub>2</sub>|Pd|YSZ|Pd cell, the partially reduced RuO<sub>x</sub>(0<x<2) is the main active site for NO decomposition. In the reaction temperature range of 650~700℃, NO is selectively decomposed in the presence of O<sub>2</sub> at suitable voltages between 0V and 4V on the RuO<sub>2</sub>|Pd|YSZ|Pd cell.

**Key words** [ELECTRO-CATALYSIS](#) [NO](#) [DECOMPOSITION](#) [ELECTROLYTE](#) [RUTHENIUM OXIDE](#) [PLATINUM](#) [ELECTROLYSIS](#)

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