Study on Preparation for an Environment Catalyst—Perovskite-type Rare Earth Oxides $LaFeO_3$

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China's Panxi area is China's second largest ore belt, in which vanadium-titanium magnetite is one of the most important minerals. In the process of recovering vanadium titanium magnetite, the vast majority of perovskite ($CaTiO_3$) in the form of loss in the blast furnace slag, which has not been recovered.This is not only a waste of resources, but also a serious environmental pollution problems. Therefore, the use of its tailings ($CaTiO_3$) and La_2O_3 and Fe as raw materials, for the preparation of environmental catalyst $LaFeO_3$.

Perovskite type composite oxide is a kind of catalytic material with excellent activity, the wavelength of the excitation light matches the visible light. It can not only realize the photolysis of water, purify the air, but also catalyze the degradation of organic matter with a variety of structures, which is of great significance to solve the problem of environmental pollution. The particle size of photocatalyst TiO_2 is relatively large, the specific surface area is small, and the band gap is wider, the utilization of sunlight is very low.But the $LaFeO_3$ band gap is smaller, the absorption wavelength tends to visible light region, has better catalytic performance. The range of light response can be further expanded by doping modification, therefore, perovskite-type composite oxide $LaFeO_3$ has a wide application prospect. The main research contents and achievements are as follows:

1. The $LaFeO_3$ powder was synthesized by hydrothermal method, and adding alcohol amine complexing agent, the $LaFeO_3$ powder with high purity can be prepared at lower temperature, and the specific surface area can be obtained to enhance the photocatalytic performance.

2. The use of Variable metals Mn, Ce to replace Fe or La, can reduce the band gap, the absorption peak of lanthanum ferrite to visible light movement, improve the utilization of natural light rate.

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