



Method for Preparing Me/W18O49 Supported Catalyst by Oriented Deposition of Noble Metals by Virtue of Self Reduction Method

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ABSTRACT

The invention discloses a method for preparing a Me/W18O49 supported catalyst by oriented deposition of noble metals by virtue of a self reduction method and belongs to the field of preparation of supported catalyst materials. The method is characterized by comprising the following steps: mixing a tungsten source with anhydrous ethanol, and ultrasonically stirring; transferring into a reaction kettle, and reacting at 180 DEG C for 24 hours to obtain W18O49; centrifuging, washing and drying the prepared self-reduction W18O49; mixing the product with anhydrous ethanol; performing ultrasonic treatment for 30 minutes; adding a novel metal solution; performing ultrasonic treatment for 30 minutes; magnetically stirring for 12 hours; and washing and centrifuging to obtain the supported catalyst. According to the technical scheme, the self reduction method is adopted, and other reducing agents are not added in a supporting process, so that the method disclosed by the invention has selectivity of oriented deposition, and the prepared supported catalyst has a relatively high noble metal atom yield.

DESCRIPTION

Since deposition of precious metals to restore legal preparation Me / W18O49 supported catalyst method

TECHNICAL FIELD

The present invention belongs to the field of preparation of supported catalyst material, in particular to a method for preparing Me / W18O49 (Me = Pt, Au, etc.) supported catalyst.

Background Technique

The supported catalyst basically combines the advantages of inorganic heterogeneous catalyst and homogeneous catalyst metal organic complexes, it not only has a high selectivity and activity, small resistance, and easy to recycle reuse and stability Great.

In 18O49 as the carrier of Pt / W18O49 supported catalyst for a fuel cell cathode catalysts can improve the oxygen reduction activity and stability, while the advantages of anodic methanol oxidation activity and anti CO poisoning can also be improved. However, the noble metal catalyst during preparation yield is low load, the noble metal is likely to cause waste of raw materials.

How directional deposition supported catalyst prepared in high yield is very important.



SUMMARY OF THE INVENTION

The present invention for the preparation of the noble metal catalyst loading yield lower insufficient, there is provided a self-reducible to the preparation of legal deposition supported catalyst.

The present invention provides a self-reducible legal to deposit precious metal preparation Me / W18049 supported catalyst, wherein said steps are as follows: tungsten from the mixed ethanol and ultrasonic agitation, transferred into the reactor, at 180 degrees for 24 hours to obtain W18049, W18049 centrifugal self-reducibility prepared, washed, dried, and then the product is mixed with absolute ethanol, and ultrasonic 30min, the noble metal solution was added thereto, and then subjected to ultrasonic 30min, under magnetic stirring for 12 hours and washed by centrifugation i.e. supported catalyst obtained.

Further, the noble metal solution used is 1 (2? Ratio of 14 or H₂AuCl₄ solution.

Further, the noble metal solution concentration of 1mg / ml-5mg / ml.

The advantages of the present invention is:

- 1, the program uses self-reduction method, the load process without adding additional reducing agent.
- 2, the program will restore the precious metal on the tungsten oxide support selective directional deposition.
- 3, this program supported catalyst prepared in high yield its precious metal atoms.

DETAILED DESCRIPTION

The present invention is one specific embodiment, the drawings and the embodiments of the present invention will be described in detail, but the present invention is not limited to the following examples.

Example 1:

First, 120mg WC16 crystalline powder mixed with 60ml of absolute ethanol and sonicated for 30 minutes, waiting for uniformly mixed into 120ml autoclave, the degree of filling of the reactor is 50%;

Then, the reactor was at 180 degrees Celsius for 24 hours. After completion of the reaction, the product was cooled and treated with absolute ethanol and deionized water, centrifugation and drying;

Then, the resulting product is 18,049 mixed with 60ml of absolute ethanol and sonicated for 30 minutes, to the solution was added after ultrasound 3ml/mg / mlK₂PtCl₄ solution, and then 30 minutes of ultrasound;



Finally, the last step the resultant solution was magnetically stirred at room temperature under atmospheric pressure for 12 hours and treated with absolute ethanol and deionized water, centrifuged, and dried.

Example 2:

First, 120mg WC16 crystalline powder mixed with 60ml of absolute ethanol and sonicated for 30 minutes, waiting for uniformly mixed into 120ml autoclave, the degree of filling of the reactor is 50%;

Then, the reactor was at 180 degrees Celsius for 24 hours. After completion of the reaction, the product was cooled and treated with absolute ethanol and deionized water, centrifugation and drying;

Then, the resulting product is 18,049 mixed with 60ml of absolute ethanol and sonicated for 30 minutes, to the solution was added after ultrasound 2ml/mg / mlHAuC14 solution, and then 30 minutes of ultrasound;

Finally, the last step the resultant solution was magnetically stirred at room temperature under atmospheric pressure for 12 hours and treated with absolute ethanol and deionized water, centrifugation and drying, the product was collected.

Comparative Example:

Following the same steps as in Example 1, first, 120mg WC16 crystalline powder mixed with 60ml of absolute ethanol and sonicated for 30 minutes, after waiting for mixing, into the 120ml autoclave, the degree of filling of the reactor was 50 %;

Then, the reactor was at 180 degrees Celsius for 24 hours. After completion of the reaction, the product was cooled and treated with absolute ethanol and deionized water, centrifuged, after centrifugation and dried;

Then, the resulting product was mixed with 18,049 60ml absolute ethanol and sonicated for 30 minutes, to the solution was added after ultrasound 3ml/mg / mlK2PtCl4 solution, which was transferred to the autoclave, at 180 ° C for 24 hours, the reaction was complete with anhydrous ethanol and washed with deionized water, centrifuged, and dried;

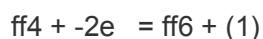
Finally, the last step the resultant solution was magnetically stirred at room temperature under atmospheric pressure for 12 hours and treated with anhydrous ethanol and deionized water, centrifugation, centrifugation and dried product collected.



Preparation Table 1 common Supported Catalysts

方法	贵金属及载体	还原剂	反应条件 (温度)
高温热还原	Pt/ Al ₂ O ₃	乙二醇	120° 油浴
高温热还原	Rh/Al ₂ O ₃	H ₂	600°
高温热还原	Pt/TiO ₂	H ₂	200°
自还原	Pt/W ₁₈ O ₄₉	无需添加其他还原剂	常温

The present invention provides a legal mechanism of deposition of precious metals from reducing preparation Me / W18049 supported catalyst to the method as follows:



The method is selective directional deposition, reducing time and without high-temperature conditions, than the general method of saving energy, but also get a good catalytic performance.

Need to add is that, according to the specification interpretation and elaboration of technical personnel in the field of the present invention may also be changes and modifications to the above embodiments according to the actual situation. Accordingly, the present invention is not limited to the specific patent embodiments illustrated and described above, and to modify or change some of the equivalent field of the invention within should also be within the scope of protection of the present invention. In addition, some technical terms described in this invention, illustrative only convenient expression, does not limit the present invention.