**Nanocomposites and nanomaterials**

**The study of reduce CeO2-MoO3 system modified by mechanochemical and ultrasonic methods**

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Ce-Mo-O compositions are well known for ecological catalysis, and partial oxidation processes. The preparation of CeO2-MoO3 compositions was carried out by two ways: i) CeO2-MoO3-UST − treatment in a dispersant UZDN-2T and ii) CeO2-MoO3-MChT − treatment in a ball planetary mill Pulverisette-6 (Fritsch). The aim of this work was studies of UST and MChT impacts on reducing properties (in H2-Ar mixture at 30-800°C) of Ce-Mo-O system.

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| f1a_ | f1b_ | f1c_ |
| Fig. 1. TG (1) and DTG (2) dependences of hydrogen reduce of samples:  CeO2-MoO3 initial (a), CeO2-MoO3-UST (b) і CeO2-MoO3-MChT (c). | | |

The TG and DTG dependence of the hydrogen reducing of the CeO2-MoO3 samples is presented in fig. 1. It was shown that the reducing of the initial sample CeO2-MoO3 (fig. 1 a) begins at 400°C, that is 100°C less than the reducing of MoO3. There are several effects on the DTG curve, that is explained by the stepwise reducing of MoO3 to MoO2 and then to Mo. In these conditions, the reducing of CeO2 was carried out partially with the formation of CeO1.82-1.84. For the CeO2-MoO3-UST the reducing begins at 300°C with formation of MoO2 (~550°C) and Mo (~750°C) that is clearly observed on the reducing curves (fig. 1 b). It is found that the reduce of CeO2-MoO3-MChT was begun at 250°C, UST and MChT lead to the significant activation of the surface layer and the defects appearance in the structure of CeO2-MoO3 samples, that accompanied by an increase of oxygen mobility and the ability to remove it already at 250-300°C as a result of controlled reducing.