

Thermodynamic Properties of Systems Carbon and Chromium (C+Cr) and Their Temperature Dependence

Safarov Mahmadali Mahmadiyevich^{C,S}, Nematov Golib Nuralievich and Najmidinov Sharofidin Zoirovich
Tajik Technical University after named Academician M.S. Osimi, Dushanbe, Tajikistan

Colloidal solid-like-solution C-Cr alloy nanoclusters of different composition were synthesized through a citrate reduction technique without using any other protective or capping agent. The thermodynamics properties of the nanofluids are seen to be strongly dependent on the composition of the particles. A linear dependence is observed between the value of the thermodynamics properties of nanofluids and the C/Cr molar ratio. A possible mechanism for such dependence of the nanofluids with bimetallic particles is given. UV-Vis, transmission electron microscopy (TEM), high-resolution electron microscopy (HREM) and high angle annular dark field (HAADF) imaging techniques were used to reveal the alloy structure of the nanoclusters. Peloids have been used as thermodynamics properties agents in many spas and thermal centers since ancient times. The terms "peloid" is used to refer to different kinds of sediments or deposits whose compositions include mainly chromes but also carbonates, and variable amounts of organic substances. When mixed with different sea or salt lake mineral-medical waters, these elements form pastes or poultices for thermal uses [1]. Thermodynamic properties (ρ , T , C_p , $(dP/dT)_V$) of carbonium and chromes have been measured with a high-temperature, and nearly constant-volume calorimeter. Estimation and analysis of experimental calculated theoretical studies in the field of investigation of thermodynamic properties of C+Cr mixtures at the present stage have been made. It is shown that the available experimental data are not numerous, they have not previously been systematically analyzed. To obtain new data for thermodynamic properties of alloys, an acoustic method of investigating the properties of the substance has been used. The general relative errors of measurement of ρ and C_p at a confidence level of 95 % are 0.1, and 3.0 %.

[1] San Martin Becaicoa, J, 1994, Peloids en general, Caracteristicas fisicas, efectos biologicos e indicaciones terapeuticas. Ed: Armijo, San Martin, J(Eds), Curas halnarias y clymaticas. Madrid, pp. 315-331.