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Sorption extraction of vanadium from acidic solutions

© **Denis P. Ordinartsev**,[1]* **Alexey V. Sviridov**,[1,+]
Stanislav S. Naboychenko,[2] and **Vladislav V. Sviridov**[1]
[1] *Department of Chemical Wood Technology, Biotechnology and Nanomaterials. Institute of Chemical Processing of Vegetable Raw Materials and Industrial Ecology. Ural State Forestry University. Sibirskiy Trakt, St., 37. Yekaterinburg, 620100. Sverdlovsk Region, Russia. Phone: +7 (343) 262-97-61. E-mail: denis ordinartsev@mail.ru*
[2] *Department of Heavy Non-Ferrous Metals. Institute of Materials Science and Metallurgy. Ural Federal University Named after the first President of Russia B.N. Yeltsin. Mira St, 19. Ekaterinburg, 620002. Russia.*

*Supervising author; +Corresponding author
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Abstract

There are some problems in obtaining vanadium in hydrometallurgical production. First, the vanadium must be selectively separated from metal ions present in the solution after acid treatment of the ore. Secondly, the vanadium forms a large number of different compounds, depending on concentration and pH. In this article, one of the methods of vanadium extraction by the adsorption from acid solution are presented. As the sorbent for the extraction of vanadium used montmorillonite sorbent intercalated cationic surfactants (didecyldimethylammonium chloride). Didecyldimethylammonium chloride was fixed in the interlayer space of the sorbent, thus changing its properties (sorption capacity, surface charge, the interparticle interaction coagulation). As a result of the intercalation ζ-potential of the surface of the sorbent has changed from negative to positive, and the sorbent received the property to selectively adsorb of vanadium.

It is found that on the surface of modified sorbent adsorbs only polyanions of vanadium. The thermodynamic studies have shown that the interaction with the vanadium active centers of the sorbent occurs in an "ion associates" and corresponds to the physical adsorption. The physical adsorption is characterized by a weak interaction of the sorbent with sorbed matter, which allowed regeneration of sorbent and desorption of vanadium.

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