



 Research Article

## THE CURRENT STATE OF TECHNOLOGIES FOR THE PRODUCTION AND ACTIVATED CLAY ADSORBENTS

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## ABSTRACT

It is known that adsorption events, as a rule, occur in a liquid medium containing different categories of substances, are not inert in terms of composition and properties of the medium, and are directly involved in these processes. Here, the main component is the adsorbent, which is selected depending on the nature of the liquid to be cleaned, the polarity of the substances to be removed, their concentration, and so on. In addition, such processes in heterogeneous systems are mainly regulated by the properties of the adsorbents used and the technological parameters of their operation.

## KEYWORDS

Activated clay adsorbents, acid activation of clays, local activated clays, highly active adsorbents.

## INTRODUCTION

Adsorption phenomena occur, as a rule, in a liquid medium containing substances of different classes; the medium is not inert in composition and property and is directly involved in these processes. Here, the main component is the adsorbent, which is selected based on the nature of the liquid to be purified, the polarity of the substances to be removed, their concentration, etc. [1-4].

Moreover, such processes carried out in heterogeneous systems are mainly regulated by the properties of the adsorbents used and the technological parameters of their functioning. Adsorption methods for cleaning liquids, in particular vegetable oils, are widely used in many countries, where they mainly use their own local activated clays [5-8].

Today, the purchase and transportation of imported activated clays to oil and fat enterprises is expensive for hard currency, which in turn increases the cost of manufactured goods. Taking this into account, the President of the Republic set a number of tasks for the branches of the country's economy on import substitution of raw materials and resources for local raw materials.

It is known that not all natural clays exhibit high adsorption activity in their natural form. For example, the high content of sesquioxides in bentonite clays does not allow obtaining highly active adsorbents. Even the removal of various forms of moisture does not contribute to the production of active adsorbents for oil

purification [9-13]. Therefore, one should initially study the compositions and properties of natural clays potentially suitable for obtaining adsorbents.

## THE MAIN PART

Despite the presence in the Republic of more than 100 large deposits of natural clays (kaolin, bentonite, palygorskite, etc.), there is no production of activated adsorbents on an industrial scale. In this regard, it is necessary to study the compositions and properties of natural clays suitable for obtaining adsorbents, and especially the methods and technologies for their enrichment and activation, including non-traditional ones. In recent years, non-traditional methods of activating clay adsorbents have appeared, involving the use of IR, microwave radiation, etc. [14-19].

So, for example, IR radiation from clay adsorbents mainly contributes to the activation of their surface. Such rays are mostly absorbed in very small amounts [20-22]. Another method, microwave radiation, instead of convective heating of clays, radiates them with an object, which certainly affects the structure and porosity of the inner layer of the obtained adsorbents [3].

There is a method [5] for thermal activation of clays using microwave radiation.

However, it is not effective enough. does not affect the chemical composition of the resulting

adsorbents. Unfortunately, no works on acid activation of clays using microwave radiation have been found in the literature. The patented method [4] of microwave heating of clay adsorbents is carried out by their dry heating at a temperature of 450-550 °C.

However, such activation of natural bentonites and palygorskites does not provide the necessary depth of adsorption purification of vegetable, for example, cottonseed or safflower oils.

## CONCLUSION

Therefore, further study of the possibilities of using microwave radiation to obtain directionally activated adsorbents from local bentonites and palygorskites should be considered relevant.

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