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**PATENT NO. 127098 / 2017**

## PROCEDURE FOR ARSENIC REMOVAL FROM WATERS AND WASTE IMOBILIZATION IN VITREOUS MATRIX



It is well known that arsenic is a chemical element which arrives into the environment from a variety of natural and anthropogenic sources. Long term exposure leads at appearance of a large number of health problems, such as: skin affections, bladder, kidney and lungs cancer, cardiovascular and respiratory affections and in some cases can lead at diabetes. The underground sources of drinking waters represent one of the most important sources of arsenic intoxication. Into the underground water arsenic can be found as As(V) and most frequent as As(III). From this two forms the last one present higher toxicity. Present invention is related to a method of decontaminating waters with arsenic content using sludge adsorbent material containing iron and to a valorisation of exhausted adsorbent as frites, glass or ceramic glazes. The novelty of this patent is represented by a new approach, when a nonconventional material is used as adsorbent during arsenic removal from drinking waters. This new adsorbent material is represented by a sludge containing iron ions obtained as secondary product from neutralization of wastewaters containing higher quantities of metallic oxides, especially iron one. This approach, presents two different advantages, firstly representing a suitable solution for an economical problem, reducing the usage degree of natural resources, and secondly is eco-friendly by using as adsorbent sludge obtained as secondary product from other industrial process.

In conformity with present invention the sludge with higher content of iron (approximately 33%) is used as adsorbent material during purification of waters with arsenic (III) content between 10 and 700  $\mu\text{g}\cdot\text{L}^{-1}$ . As result, was obtained a waste product with higher toxicity and an arsenic content between 0.01 and 0.2%. Such waste product can be used for production of coloured glasses, or frites with higher content of  $\text{Fe}_2\text{O}_3$ .

Immobilization of arsenic waste resulted from such adsorption by inclusion into the vitreous matrix represents a new solution as also a responsible attitude, sustaining the durable development of human society.

As conclusion present invention resolves such desideratum by using the principle of close technology, by valorisation of arsenic containing waste by immobilization into the vitreous matrix, for production of glasses or ceramic decorative glazes, protecting in this way the environment.