

Design And Testing For Treatment Plant of Industrial Liquid Wastes Produced By Leather Tanning Industry Using Aleppo Bentonite

Eng. Sonia Abbasi*

Dr. Hend Wahba**

Dr. Mohammed Al-Masri***

Abstract

Chromium is widely used among the industry field, such as electrical painting, steel industry, textile industry, wood protection, paper industry and printing in addition to chromium compounds preparation. So, resulted wastes of these industries contain chromium.

Chromium Tanning industry is considered as one of the most popular methods of leather tanning, where about one third of the used chromium in tanning is waste and drained into the waste water drainage networks, which leads to a serious environmental pollution and economical loss.

Thus, chromium wastes are considered as the most recognizable metallic pollutant found in the waste water produced by the tanning industry.

As a step in approaching a development in liquid wastes management in Syria through finding some new and healthy methods and techniques, researches and studies are done considering effectiveness and economical aspects to treat this pollution.

This research aims to design and test treatment plant to remove and recover the chromium from tanning waste water using Aleppo Bentonite which is found naturally in Syria in order, to implement a cheap and effective method of treatment.

Since the Aleppo Bentonite is found in plenty amounts and cheap resources in Aleppo city, northern Syria, as well as its structure of Aluminum Silicate, and its unique crystal structure, it fits to be utilized in heavy metal removal (especially chromium) from polluted waste water of tannin. It plays an important role in protecting the environment and human, in addition to recycle the waste water economically without the need to prepare any ionic exchange materials that are expensive.

The practical experiments applied on treatment plant with design in environmental lab of the faculty of civil engineering on actual samples collected from tanning factories in

For the paper in Arabic see pages (137-159)

* Faculty of Civil Engineering, Damascus University

** M.S, Department of Protection and Safety, Atomic Energy Commission

*** M.S, Department of Protection and Safety, Atomic Energy Commission

Damascus showed that:

- 1- Chromium removal from tanning waste water is achieved with percentage of 97 %.**
- 2- Chromium recovery from the used bentonite, the recovery percentage were 94 % as chromate, which can be utilized in many fields of industry in the forms of lead chromate, barium chromate, chromate acid, and chromate sulfate.**
- 3- Re- use of bentonite after chromium recovery is safely is some industries, such as cement industry, ceramic industry, etc.**
- 4- Recycling of waste water produced by the treatment and using it again in tanning industry.**

This research supports the fact that it is possible to make use of those national raw materials through developing an environmental friendly technology for treating the liquid industry wastes produces by tanning industry, as well as supporting the development process in Syria.

Keywords: chrome, tanning industry, Aleppo Bentonite, industrial waste water treatment.