



# Effectiveness of Merck and Rafsanjan Activated Carbon in Reducing Taste, Odor, and Algae Load in Water Entering the Water Treatment Plant in Sanandaj

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## ABSTRACT

**Introduction:** The presence of nitrogen and phosphorus elements in water environments causes the excessive proliferation of algae and aquatic plants; this rapid growth leads to eutrophication and eventually disrupts water quality, including taste and odor. Qeshlaq Dam, which supplies drinking water to Sanandaj, has also experienced the aforementioned problems and affected the lives of the 500,000 people of this city. The purpose of this project was to mitigate taste and odor, as well as to decrease the presence of diatom and *Chlorophyceae algae*—factors that contribute to undesirable taste and odor—by employing surface absorption using activated carbon.

**Methods and Materials:** This interventional study was conducted on the raw water from Qeshlaq Dam, which had a taste and odor index of 9 tons, a diatom count of 280,000, and a chlorophyll concentration of 910 in 100 cc of water. For the adsorbent, we utilized activated carbon from Merck, Germany, as well as activated carbon from Rafsanjan. Additionally, Whatman 41 filter paper with a porosity of 20 microns was used. After passing through the absorbent surface, the raw water was filtered through the filter paper, and secondary evaluations were performed.

**Results:** The results obtained from the tests showed that Merck activated carbon, at an optimal dose of 10 ppm, reduced the taste and odor index by 72.2%, diatoms by 99.2%, and chlorophyll by 87.9%. At the ideal dosage of 18 ppm, it further reduced the taste and odor index by 88.8%, diatoms by 99.8%, and chlorophyll by 91.2%. In contrast, the use of Rafsanjan activated carbon at an optimal dosage of 14 ppm resulted in a reduction of the taste and odor index by 77.7%, diatoms by 99%, and chlorophyll by 72.5%. At the ideal dose of 18 ppm, Rafsanjan activated carbon reduced the taste and odor index by 88.8%, diatoms by 99.1%, and chlorophyll by 89%.

**Conclusion and Discussion:** The findings obtained from this research proved the efficiency of using activated carbon as an absorbent to reduce the taste and odor and reduce the algal load of water. Also, the activated carbon used by both companies had an acceptable efficiency, but Rafsanjan's activated carbon was reasonably priced. Hence, it is more suitable for use.

**Keywords:** Iran, Odorants, Taste

