

IRRADIATION PROCESS APPLIED IN FISH SCALES: AN IMPROVEMENT OF ITS CAPACITY FOR METALLIC SORPTION?

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Metal removal of environmental samples is an important study subject since this contamination category may affect human health direct or indirectly. There are many known methods to proceed to the metal removal¹; each one has advantages and drawbacks. Metal precipitation is a simple and an efficient process but it must be performed when high concentration of metal ions are present; ion exchange methods are fast and the removal occurs efficiently even under very low concentration of metal ions (removal of ppb levels) but can be an onerous method if great volumes must be treated; membrane methods are still very expensive to be applied in water treatment due high costs of dialysis material and maintenance of dialysis system – so, to be applied in effluents cleaning, the values are prohibitive.

Then, a good material to be applied in metal removal process must be low cost, easy to acquire and efficient in its purpose. Generally, fibrous materials are selected for this finality because of their great surface area that is a physical condition to perform the metal sorption. In this sense, cellulose fibrous biomaterials (like sugarcane pulp and rice peel) and porous materials (like charcoal) are employed in this use.

Fish scales are a disposable byproduct of fisheries that have high potential to be used as ion metals sorption material due to the fact that they have two regions with distinct properties: one external constituted by a thin layer of low crystalline hydroxiapatite – this layer has high surface area and many studies indicate that this region has an efficient metal removal characteristic and one internal thicker layer with fibrous nature done by the collagen fibers^{2,3}. Fish scales as a raw material acts efficiently in metal removal mainly at high concentrated solutions; there is a work that indicates an enhancement of sorption effect when fish scales are treated with gluteraldehyde⁴.

In this work, fish scales were submitted to ionizing radiation process. Our group investigated the effect of dose rate and absorption dose related to its ion metal sorption capability analyzing physical and chemical parameters of fish scales before and after irradiation process.

REFERENCES

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