INVESTIGATIONS OF METALS PRESENT IN POLYMER COMPOSITION OF PLASTIC DEBRIS BY EDXRF TECHNIQUE

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Plastics are one of the most common and persistent pollutants in ocean waters and beaches worldwide, causing harmful effects on marine biota. The composition of these plastics mainly includes polyethylene (PE1) and polystyrene (PS). The marine environment is impacted in various ways and, in extreme cases, diseases can emerge among seafood-consuming inhabitants due to contaminants (such as the toxic additives) in the plastic composition. Specifically, the objective of the present investigation is to analyze ions and metals in PE1 and PS samples exposed in the Jurujuba region (Baía de Guanabara, Rio de Janeiro) for different periods using the Energy Dispersive X-Ray Fluorescence (EDXRF) analytical technique. This analysis will help identify toxic metals present in these polymer compositions as well as metals adsorbed on the plastic surface, contributing to defining measures to address this issue. Samples (in triplicate) were divided into three groups: I) Standard: sample available commercially; II) Control: sample exposed only to ultra-pure water, in the dark with a controlled temperature of 25 degrees Celsius; III) Exposed samples in Jurujuba (Baía de Guanabara, RJ). This study is part of a larger research project "Strengthening capacities in Marine and Coastal Environments using nuclear and isotopic techniques" (IAEA/ARCAL: RLA7025). These results emphases the toxicity of marine pollution, and show that PET and PS polymers can act as carriers of pollutants between ecosystems.