

Assessing Chlorine Contamination in Marine Fish Tissue Using Instrumental Neutron Activation Analysis

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Monitoring chlorine levels in marine fish tissue is critical for assessing environmental contamination, ecosystem health, and potential risks to human health through seafood consumption. Chlorine, often present as organochlorine compounds or inorganic chloride, can accumulate in marine organisms due to anthropogenic activities such as industrial discharges and agricultural runoff. Elevated chlorine levels may indicate exposure to pollutants like polychlorinated biphenyls (PCBs) or pesticides, which pose toxicological risks. Instrumental Neutron Activation Analysis (INAA) is a highly sensitive, non-destructive analytical technique justified for measuring chlorine in fish tissue due to its ability to detect trace elements with high precision and minimal sample preparation. INAA's multi-elemental capability allows simultaneous analysis of chlorine alongside other elements, providing comprehensive data on contaminant profiles. Its non-destructive nature preserves samples for further analyses, and its low detection limits ensure accurate quantification of chlorine even at trace levels. This study underscores the importance of chlorine monitoring in marine fish and advocates for INAA as a robust method to support environmental and public health research.