

Quantitative analysis of feather samples taken from wild birds such as swan, waxwing, osprey, heron and crow

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Abstract

The standard-free method developed by ourselves 13 years ago has been widely applied to quantitative analyses of hairs such as human head hair and body hair taken from companion and domestic animals. In the present work, the standard-free method for feather and down samples taken from wild birds such as swan, waxwing, osprey, heron and crow was developed. It is found that the standard-free method developed for human hairs can be successfully applied to feather samples without essential modification since the main constituents of feather are almost the same as those for human and animal hairs and, consequently, the shape of continuous X-rays is also the same. The method allows us to quantitatively analyze untreated feather samples of very small quantities and to prepare the target without complicated preparation technique. Accuracy and sensitivity of the present method were examined by comparing the results with those obtained by an internal-standard method combined with a chemical-ashing method, and it is confirmed that the method is applicable to feather and down samples taken from birds of various species. It is expected that the method will become a powerful tool for the studies not only on the mode of life of wild birds but also on environmental contamination by toxic elements.

Keywords : PIXE, Feather, Down, Standard-free, Wild bird, Untreated, Elemental concentration, Quantitative analysis, Environmental contamination