

Analysis of Heavy Metals and Nutrients in Seaweed using pXRF

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Seaweed is a resource that is increasingly being used in many different areas including food, supplements, industrial, cosmetics and agricultural fertilizers. The uptake of nutrients and heavy metal contaminants from water can vary between species and is also related to the availability of the compounds and the environmental conditions for the plant.

The presence of heavy metals in the water can be due to several factors such as geological (being naturally present), industrial (anthropogenically introduced), agricultural (excess fertilizer) and human waste. In fact seaweed is now often used to clean water because of its uptake ability for these elements.

However, the presence of the heavy elements in any products that are either consumed or used by humans is an issue. Many of the heavy elements such as lead, arsenic, mercury and cadmium are toxic to the body and can cause significant neurological problems. So, it is important to be able to measure these elements in the seaweed before it is used in the products.

We created a matrix matched calibration to analyse the seaweed for its nutrient levels and heavy metals contamination using a Bruker Tracer 5G and Bruker calibration software. Elements from sodium to lead were detected in the seaweed. The advantage of using pXRF is that it can be done on location and is quicker and more cost effective than laboratory analysis.