

Method of Recovering Perfluorinated Compounds by coffee grounds

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There are organofluorine compounds that are potentially carcinogenic, bioaccumulative, and persistent. Among them, perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) were widely used in the life related products. Until recently, organofluorine compounds have been widely used mainly in products related to daily life due to their chemical stability, and are used especially for water-repellent coating processing, but many of them have flowed into the environment. Due to this, in recent years, there have been many reports on the environmental pollution of organic fluorine compounds. Coffee, on the other hand, is a beverage consumed around the world and its consumption is increasing year by year. However, most of coffee bean residue, which is the extraction residue, is incinerated as food waste. Therefore, as one of the effective uses of coffee grounds, the use of coffee grounds as an adsorbent for harmful substances is being sought. In this study, coffee grounds are known to have adsorption capacity for toxic substances, but their effectiveness against organofluorine compounds is not known. Therefore, an adsorbent using coffee bean residue is prepared, and the presence or absence of an adsorbing ability for PFOS and PFOA, in particular, is clarified this time. As a result, we believe it would be better if we could find new reuse values for coffee grounds and reduce environmental pollution and food waste. In this experiment, we conducted a water passing experiment using coffee bean dregs that had been subjected to untreated, boiling, bleaching and carbonization (240 °C, 400 °C), and environmental water (well water) that contained a large amount of activated carbon and PFOA. For each treatment, it was considered that the adsorption capacity would change by adding the treatment to the coffee grounds, and the bean grounds samples were prepared under the above four treatment conditions. In the water passing experiment, the column tube equipment for the water passing experiment was made by collecting and preparing materials suitable for the experiment conducted this time, and fine adjustment was carried out. The results obtained showed that coffee grounds had adsorption ability for PFOA. It was also found that addition of each treatment could improve the adsorption ability of most coffee grounds. In the carbonization treatment, it was found that the adsorption capacity was improved by the treatment at a higher temperature.

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