

エージング作用による石炭灰中の有害元素の不溶化効果とセレン(Se)の挙動に関する研究



Study on Leaching Inhibition Effect of Hazardous Elements and Behavior of Selenium in the Coal Ash which Received the Aging Action

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要 旨

本研究では、石炭灰の有効利用推進の立場から、湿潤で静置されるといった、エージング作用による石炭灰中の有害元素の挙動変化を調べた。エージング作用を受けた石炭灰に対する溶出試験を実施し、エージングによる有害元素(Se, B, F)の不溶化効果を示した。また、Seの溶出挙動に着目した試験・解析を実施し、石炭灰粒子の表面に一樣に分布するSeが、同表面の近傍に偏在するCa, Fe, Al, Siと共に、粒子表面の付着物や吸着物として取り込まれると共に、特にCaやFeに取り込まれたものは強固な不溶化となり、AlやSiに取り込まれたものは再溶出性が高いことを示唆した。また、数年以上といった長期のエージング中には、CaやFeが徐々に溶脱し、それに取り込まれていたSeが再溶出する可能性があることを示した。

キーワード：石炭灰，エージング，溶出，有害元素，セレン

Summary

Promoting the effective utilization of coal ash is urgently needed. In this situation, the authors focused on changes in the properties of coal ash that has undergone aging action. Coal ash that has undergone aging is considered suitable for recycling in terms of environmental safety. In this study, laboratory aging tests, in which the aging conditions were controlled, were carried out. From these tests, it was suggested that there was a general tendency for the concentration of trace hazardous elements leached to be reduced due to the coal ash undergoing an aging process. And selenium (Se), which is uniformly distributed on the surface of the coal ash particles, was fixed by Ca, Fe, Al and Si-based compound which were distributed on each area of the surface of the particles. In addition, it was suggested that Se which was fixed Ca and Fe based compound was stable fixed, while Se which was fixed Al and Si based compound was easily re-leached. Furthermore, in the case of landfilled coal ash, which had undergone aging in seawater for a long period, it was predicted that Se, which was fixed Ca and Fe based compound, was leached concurrently with Ca and Fe.

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