

Major and trace elements in coal bottom ash at different oxy coal combustion conditions

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Abstract

This paper presents a detailed study on the effect of temperature on the concentration of 27 major and trace elements in bottom ash generated from oxy fuel-combustion. The major elements are Na, Mg, Al, K, Ca and Fe and the minor and trace elements are Li, Cr, V, Mn, Sr, Ba, Cu, Zn, Rb, Co, Ni, Ga, Pb, Be, Mo, U, Ag, Cd, Te, Bi and Ti respectively. The effect of oxygen concentration at two different temperatures on the concentration all the elements was investigated. From the results obtained, the highest level of enrichment for all the elements in the bottom ash was at oxy combustion conditions of 50% O₂ and 50% CO₂ at 900 °C. An exception was for Fe, Mn and Mo where it was at 21% O₂ and 79% CO₂ at 1000 °C, 21% O₂ and 79% CO₂ at 900 °C and 50% O₂ and 50% CO₂ 1000 °C respectively.