

发电

燃煤高钙灰的组成及其演化机制的研究

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摘要

采用低温灰化仪、X射线衍射仪和场发射扫描电镜系统研究了小龙潭电厂煤及其高钙飞灰的矿物学特征和化学组成。结果表明：不同高钙灰颗粒化学组成差异较大，颗粒成分呈现出很强的非均质性。依据单颗粒中元素种类及含量建立了高钙灰的分类系列，即：钙氧化物相；钙硫酸盐相；钙硅铝酸盐相和Ca-S-X相（X：Fe，Al，Si，Mg等）。钙氧化物相主要源于煤中含钙碳酸盐的分解；钙硅铝酸盐相组成复杂，其主要源于内在矿物的融合凝并以及外在含钙矿物与外在硅铝质矿物的烧结；钙硫酸盐相和Ca-S-X相是含钙矿物的自脱硫产物；外在含钙矿物易形成钙硫酸盐相；而内在含钙矿物易形成Ca-S-X相；Ca-S-X相主要源于脱硫产物CaSO₄与硅铝酸盐的结合。

关键词 [化学组成](#) [演化机制](#) [高钙灰](#) [煤燃烧](#)

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Abstract

The mineralogy of coal and chemical composition of high calcium fly ash were studied by low temperature asher (LTA), X-ray diffraction (XRD), and field scanning electron microscopy equipped with energy dispersive X-ray analyzer (FSEM-EDX). The composition of high calcium fly ash particles are varied from each other. On the basis of chemical composition, the high calcium fly ashes were classified into four series namely: calcium oxide phase; calcium sulphate phase; calcium aluminosilicate phase; and Ca-S-X (X: Fe, Al, Si, Mg, et al.) phase. Calcium oxide phase is mainly derived from the decomposition of excluded calcium-bearing mineral, while calcium aluminosilicate phase is formed by the fusion of included calcium-bearing minerals. And both of calcium sulphate phase and Ca-S-X phase are the self-desulphurization production of calcium-bearing mineral, calcium sulphate phase is formed by the excluded calcium-bearing minerals easily; while Ca-S-X phase may derive from the fusion of included calcium-bearing minerals' self-desulphurization production and other minerals in coal.

Key words [chemical composition](#) [evolution mechanism](#) [high calcium fly ash](#) [coal combustion](#)

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