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THE TG/DSC COUPLING AT THE MS TO DETERMINATION AND CHARACTERIZATIONS OF RE3+ LUMINOPHORS

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Thermal analytical techniques were used to analyse gaseous products evolved during the co-firing of coal with refuse derived fuels. The combined thermogravimetric (TG/DSC) coupling with mass spectrometry (MS) techniques were employed to study and characterize the behaviour pathways for the formation of gaseous products during combustion, such as Cl, HCl, CO, CO2, H_2O, NO_2, SO_2 and others organic compounds. The discovery of molecular CO_2, H_2O, NO_2 and SO_2 led us to look for the possible formation of oxysulfate luminophors compounds ($RE_2O_2SO_4$) in the combustion process. NO2, SO2 species are released in the different temperatures and changed according to RE^{3+} ratio range and in higher concentrations during fast heating rates compared to relatively slow ones. These results confirm the optimal temperature of RE2O2SO4 stabilization and formation of this compound; in particular at the Tb^{3+} (green emission colour) ion due to the probability of oxidation to Tb^{4+}.

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