

研究简报

甲异羟肟酸-硝酸辐解产生的H₂和CO

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摘要 甲异羟肟酸(FHA)是有望用于乏燃料后处理的新型无盐络合剂。用5 μm分子筛填充柱与热导池检测器(TCD)联用的气相色谱法研究了HNO₃ 0.2 mol/L FHA辐解产生的H₂和CO。H₂的分析是以Ar作载气, 柱温为85 °C, TCD温度为120 °C; CO的分析是以H₂作载气, 柱温为50 °C, TCD温度为80 °C。研究表明, H₂的体积分数随剂量的增加而增大, 随HNO₃浓度的增大而减小; CO只有在剂量很高时才产生, 且其体积分数远比H₂低, CO的体积分数随剂量的增加而增加。当c(HNO₃)≤0.5 mol/L时, CO体积分数低于0.2 mol/L FHA水溶液辐解产生的CO, 但当c(HNO₃)≥1.0 mol/L时, CO的体积分数大于0.2 mol/L FHA水溶液辐解产生的CO, 且CO体积分数随c(HNO₃)的增大而增大。

关键词 [FHA](#) - [HNO₃](#) - [辐解](#) - [氢气](#) - [一氧化碳](#)

分类号

H₂ and CO Produced by Radiolysis of HNO₃ FHA Solution

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Abstract Formohydroxamic acid (FHA) is a new salt-free complexant which may be used in the reprocessing of spent nuclear fuel. This paper reports on the study of H₂ and CO produced by radiolysis of HNO₃ 0.2 mol/L FHA. These analyses were performed by gas chromatography in which a packed 5 μm molsieves column and a thermal conductivity detector (TCD) were used. Argon was used as a carrier gas in the analysis of H₂, the temperature of column and TCD was 85 °C and 120 °C respectively; H₂ was used as a carrier gas in the analysis of CO, the temperature of column and TCD were 50 °C and 80 °C respectively. The results show that the volume fraction of H₂ increases with the dose, but decreases with the concentration of nitric acid. CO is only produced at high dose, and the volume fraction of CO is much lower than that of H₂. The volume fraction of CO increases with the dose. When the concentration of nitric acid is not more than 0.5 mol/L, the volume fraction of CO is lower than that produced by 0.2 mol/L FHA aqueous solution; when the concentration of nitric acid is no less than 1.0 mol/L, the volume fraction of CO is higher than that produced by 0.2 mol/L FHA aqueous solution, and the volume fraction of CO increases with the concentration of nitric acid.

Key words [formohydroxamic acid](#) - [nitric acid](#) - [radiolysis](#) - [hydrogen](#) - [carbon monoxide](#)

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