

Self-radiation reaction between tritium and carbon dioxide at elevated temperature

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Tritium that is used as fuel in fusion reactor is suspected to exist in various gaseous mixtures. And it is well known that beta ray released from tritium enhanced the reaction between tritium and others. Gaseous mixtures containing tritium also exist at elevated temperature in fusion reactor, however, there is few study the reaction at such temperature. Therefore, temperature dependent of these reactions is still unknown. We focused on the reaction between tritium and carbon dioxide at elevated temperature, self-radiation reactions at 373, 473 and 573K were investigated. Self-radiation experiment using high purity gaseous tritium was carried out in the chamber of stainless steel at atmospheric pressure and initial ratio between gaseous tritium and carbon dioxide was almost 1:1. After 2 weeks experiment, gas contents and these concentrations were measured with quadrupole mass spectrometer. Main products were carbon monoxide, water and methane. And production ratios of such products were almost same at any temperature. Therefore, it was found that self-radiation reaction between gaseous tritium and carbon dioxide is independent of temperature in the range of 373-573K.