

Hydrogen isotopes separation by thermal cycling absorption process

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Abstract

CEA/Valduc has developed a Thermal Cycling Absorption Process (TCAP) experimental device to separate hydrogen isotopes. Due to an original column design, very short cycles can be achieved. A dynamic simulation tool of the TCAP has been developed in order to propose an optimized sequence of production. The simulation results are in good agreement with the experimental results obtained with protium–deuterium separations. Modeling of a ternary system indicates that high purity tritium can be recoverable from a ‘poor’ mixture. This simulation tool has been applied finally to propose optimized separation sequences.

Keywords

- Differential and algebraic equations;
- Hydrogen isotopes;
- TCAP;
- Isotopic separation