

[54] METHOD OF SEPARATING ISOTOPES

[75] Inventor: Hans-Joachim Niemann, Erlangen, Fed. Rep. of Germany

[73] Assignee: Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

[21] Appl. No.: 676,461

[22] Filed: Apr. 13, 1976

[30] Foreign Application Priority Data

Apr. 18, 1975 [DE] Fed. Rep. of Germany 2517173

[51] Int. Cl.² B01J 1/10

[52] U.S. Cl. 204/157.1 R; 204/DIG. 11; 55/2

[58] Field of Search 204/DIG. 11; 55/2

[56] References Cited

U.S. PATENT DOCUMENTS

3,937,956 2/1976 Lyon 204/157.1 R

FOREIGN PATENT DOCUMENTS

1284620 8/1972 United Kingdom 204/DIG. 11

OTHER PUBLICATIONS

Farrar et al., Photochemical Isotope Separation as Applied to Uranium, Mar. 15, 1972, pp. 28-31.

Kuhn et al., Zeitschrift fur Phys. Chemie, vol. 21 (1933), (Partial translation, p. 136).

Letokhov, Science, vol. 180, No. 4085 (May 4, 1973), pp. 451-455.

Ambartzumian et al., JETP Letters, vol. 21 (Mar. 20, 1975), pp. 375-378.

Primary Examiner—Howard S. Williams

Attorney, Agent, or Firm—Herbert L. Lerner

[57] ABSTRACT

Separation of isotopes from a mixture of respective compounds particularly UF₆ compounds, containing the respective isotopes, physically or chemically by means of laser radiation, by passing through a vaporous mixture of the compounds, laser radiation having a spectral width maximally corresponding to the width of the isotope shift, the frequency being adjusted so that points of accumulation of rotational vibration lines of the one compound containing the desired isotope are covered in the spectrum, and the intensity of the radiation is so high that its absorption reaches the saturation region. With a pulsed laser, the duration of the radiation is shorter than the rotational relaxation time. With a continuously radiating laser, the intensity of the radiation is so high that the chemical or physical separation process is faster than the rotational relaxation.

10 Claims, 2 Drawing Figures

