creted unaltered. Aminoacetonitrile, 2,2′-iminodiacetonitrile and γ-aminobutyronitrile failed to give rise to cyanoacetic acid. It appears that in the metabolism of BAPN and certain other aliphatic nitriles by the rat the organic cyano group is largely unaffected and that deamination and/or oxidation occur at the other end of the molecule. Results to date tend to indicate that aliphatic nitriles are metabolized in the animal body to form ω-carboxynitriles which then undergo cleavage as proposed for the fatty acids.[5] The color reaction with diazotized sulfanilic acid affords a very sensitive method for detecting cyanoacetic acid and may be useful for studying the metabolism of other organic cyano derivatives. A detoxication product of *inorganic* cyanide, 2-imino-4-thiazolidine carboxylic acid,[6] gives a somewhat similar color with this reagent but is easily distinguished from cyanoacetic acid. Neither cyanoacetic acid or cyanacetamide produced any of the symptoms of BAPN toxicity when fed to weanling rats at the rate of 2 mg. per ml. of drinking water for seven weeks.[7] Cyanoacetic acid may be a detoxication product of BAPN. Its relationship, if any, to the connective tissue degeneration characteristic of BAPN toxicity is not known.

[5] D. E. Green, *Biol. Revs.*, **29**, 330 (1954).

[6] J. L. Wood and S. L. Cooley, *J. Biol. Chem.*, **118**, 449 (1956).

[7] J. J. Lalich, unpublished experiments.

DEPARTMENTS OF BIOCHEMISTRY AND PATHOLOGY
UNIVERSITY OF WISCONSIN
MADISON, WISCONSIN
S. H. LIPTON
J. J. LALICH
F. M. STRONG

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UO_2–PuO_2 SOLID SOLUTIONS[1]

Sir:

An X-ray diffraction investigation has been made of the solid phase relationships in the UO_2–PuO_2 system. The results show that a continuous solid solution exists, and that the lattice parameter varies essentially linearly with composition. A slight negative deviation from linearity may exist.

Some trouble was experienced in preparing satisfactory samples of the mixed oxide. Plutonia is an extremely inert substance, and at 1000° the reaction rate between PuO_2 and UO_2 is very slow. Various ways of producing an intimate mixture of plutonium and uranium compounds that could be converted to oxide were tried. The method which seemed best was to co-precipitate $Pu(OH)_4$ and $(NH_4)_2U_2O_7$ by dropping a Pu(IV)–U(VI) solution (total metal concentration *ca.* 14 g./l.) into hot ammonium hydroxide, taking care to keep the *p*H always above 8. The mixed precipitate was dried in air at 70°, then fired in hydrogen by raising the temperature to 1000° over 6 or 7 hours and holding at 1000° overnight. Samples were furnace-cooled in hydrogen.

It appears to be quite important that the firing be done in such a way as to avoid the production of well crystallized PuO_2 as a separate phase. For example, a solid solution was not produced by initial firing of the hydroxide precipitate in air followed by hydrogen reduction of the U_3O_8 to UO_2, nor by hydrogen firing of mixtures produced by evaporation of various solutions containing U and Pu. Coprecipitation of the U and Pu as peroxide was also tried and was not successful.

After the samples were examined by X-ray diffraction, a radiochemical Pu assay was done to check the composition. The Pu assay agreed with the compositions as made in each case.

X-Ray powder patterns were taken in a 114.6 mm. diameter powder camera using filtered copper K-radiation. (Wave lengths, $\alpha_1 = 1.54051$, $\alpha_2 = 1.54433$, mean $\alpha = 1.5418$ Å.) The lattice parameter was determined in most cases by graphical extrapolation of the values found for the high-angle lines on each pattern. Results are presented in Table I. The error limits on the compositions are estimated, those on the lattice parameters are estimated uncertainties in the graphical extrapolation. The solid solution has the fluorite structure, the same as PuO_2 and UO_2.

TABLE I

UO_2–PuO_2 SOLID SOLUTION FLUORITE STRUCTURE

Compn. (mole % PuO_2)	Lattice parameter (Å., 25°)
0	5.4700 ± 0.0001
12.6 ± 0.3	5.449 ± .003
20.0 ± .3	5.4544 ± .0006
35.9 ± .3	5.441 ± .003
48.1 ± .3	5.4345 ± .0005
63.1 ± .3	5.420 ± .003
73.8 ± .3	5.414 ± .002
79.4 ± .3	5.407 ± .003
100.0	5.3960 ± .0003

Thanks are due the Misses Marian Gibbs and Gladys Sturdy for measuring the films and preparing the samples, respectively; and Mr. A. Zerwekh for the Plutonium assays.

UNIVERSITY OF CALIFORNIA
LOS ALAMOS SCIENTIFIC LABORATORY
LOS ALAMOS, NEW MEXICO
ROBERT N. R. MULFORD
F. H. ELLINGER

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[1] Work done under the auspices of the Atomic Energy Commission.

S-ADENOSYLMETHIONINE AND ERGOSTEROL SYNTHESIS[1]

Sir:

The side-chain C-28 methyl group of ergosterol have been shown to arise intact from methionine.[2,3] This transfer of a methyl group was of interest since this was the first demonstration that a carbon atom may act as the acceptor of a methyl group. In order to participate in certain methyl additions, methionine must first react with ATP[4] to form an adenosylsulfonium compound, S-adenosylmethionine,[5] which may then act as the methyl donor to the appropriate acceptor. Involvement of S-adenosylmethionine as the actual donor in the transfer of methyl groups to sulfur[6] and nitrogen[7] has been de-

[1] This work was performed under the auspices of the U. S. Atomic Energy Commission.

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