which result from renormalizing the empirically damped form factor to unity and those which are obtained when only the finite range and nonlocality corrections are made.

It is seen that there is a large discrepancy between the $p_{3/2}$ strengths obtained for 25.52 MeV and those at the higher energies. This is attributed to the fact that the Q value to the $\frac{3}{2}^-$ state is -19.62 MeV, and therefore the exit-channel energy is quite low. Possibly this effect exists in the $p_{3/2}$ strengths at 31.82 MeV also. These effects are mirrored in the relative $p_{3/2}$ to $p_{1/2}$ ratios. It is seen, however, that the $p_{1/2}$ strengths remain relatively constant for each energy. The strengths obtained for the modified form factor are quite high because of the large damping necessary to obtain the fits to the angular distribution. Renormalizing the modified form factor to unity leads to spectroscopic strengths much too small. The values obtained from the cutoff method as well as those from the calculations employing finite range and nonlocality with and without the density dependence are in the neighborhood of probable values for the occupation of the shells in ^{16}O. It should be noted, however, that the normalization strength of 1.623 used by Green[10] for the density-dependent effective interaction has not been included here. If it were, the $p_{1/2}$ and $p_{3/2}$ strengths would both be reduced by 2.634, but the ratios would be left unchanged.

Comparing the values obtained for the relative $p_{3/2}$ to $p_{1/2}$ strengths, it is seen that the standard DW calculation fails to give even a plausible ratio. The relative strengths for all but one of the other calculations, ignoring the 25.52-MeV values, are within $\pm 30\%$ of the value 2. An indication of what values of this ratio of neutron strengths might be reasonable can be obtained from the measured values for the proton configuration of the ^{16}O ground state. In the $^{16}O(d, {}^3He)^{15}N$ reaction,[12] the relative $p_{3/2}$-$p_{1/2}$ strength was determined to be 1.58 when a local zero-range DW calculation was used, and 1.74 when finite-range effects were included.

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Addendum to Delayed Neutron Emission in the Decays of Short-Lived Separated Isotopes of Gaseous Fission Products*

W. L. TALBERT, JR.

Institute for Atomic Research and Department of Physics, Iowa State University, Ames, Iowa 50010

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A correction is reported to the mass-formula predictions for the onset of delayed neutron emission using the formula of Garvey and Kelson. The predictions of the Garvey-Kelson and Seeger mass formulas are given for delayed-neutron-emission thresholds which have been recently reported in elements not included in the original report.

SINCE the publication of a previous paper on delayed neutron emission in the decays of short-lived separated isotopes of gaseous fission products,[1] it has been pointed out that the β-decay energies were incorrectly inferred from the Garvey-Kelson mass formula.[2] The reported values for the β-decay energy of the precursor nuclei in Table VI of Ref. 1 are too small by the neutron-proton mass difference of 0.78 MeV (under the column for formula h). Adjustment of these values leads to agreement with the experimentally reported thresholds for delayed neutron emission as predicted with this formula,[3] with the exception of the precursor nucleus As^{84}, changing the predictions for the precursor nuclei Kr^{92}, Rb^{92}, Xe^{141}, Xe^{142}, and Cs^{141}.

Delayed neutron emission has been reported recently for isotopes of Se, Y, and Te.[4,5] The predictions of the

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[1] W. L. Talbert, Jr., A. B. Tucker, and G. M. Day, Phys. Rev. **177**, 1805 (1969).

[2] G. T. Garvey (private communication); I. Kelson (private communication).

[3] G. T. Garvey, W. J. Gerace, R. L. Jaffe, I. Talmi, and I. Kelson, Princeton University Report No. PUC-937-331, 1969 (unpublished).

[4] H. D. Schussler, H. Ahrens, H. Folger, H. Franz, W. Grimm, G. Herrmann, J. V. Kratz, and K. L. Kratz, in *Proceedings of the Second Symposium on the Physics and Chemistry of Fission* (International Atomic Energy Agency, Vienna, 1969), p. 591.

[5] L. Tomlinson and M. H. Hurdus, J. Inorg. Nucl. Chem. **30**, 1995 (1968).

TABLE I. Delayed-neutron-emission prediction by mass formulas.

Precursor	Emission observed (observed emission probability in %)	Reference	Q_β of precursor nucleus (MeV); S_n of emitter nucleus (MeV); prediction of neutron emission Seeger formula (Ref. 6)	Garvey *et al.* formula (Ref. 3)
$_{34}Se^{86}$	···	···	4.136	4.97
			5.041	5.27
			No	No
$_{34}Se^{87}$	Yes	4, 5	6.989	7.27
	(0.34±0.11)		6.575	6.40
			Yes	Yes
$_{39}Y^{96}$	···	···	7.422	6.96
			7.853	7.87
			No	No
$_{39}Y^{97}$	···	···	5.309	5.35
			5.193	5.22
			Yes	Yes
$_{39}Y^{98}$	Yes[a]	4	8.074	8.24
	(1.8±0.9)		7.705	7.55
			Yes	Yes
$_{52}Te^{135}$	···	···	5.527	5.64
			7.669	7.78
			No	No
$_{52}Te^{136}$	Yes	4	4.801	4.47
	(0.7)		4.293	4.02
			Yes	Yes

[a] The mass assignment of this precursor is not certain (Ref. 4).

mass formulas of Seeger[6] and of Garvey *et al.*[3] are compared to the experimental thresholds for these elements in Table I. In this table, the predictions of the mass formulas agree with the observed neutron-emission threshold for the decays of the nuclei Se^{87} and Te^{136}. In view of the mass-formula predictions for delayed neutron emission in the decay of Y^{97}, it might be suggested that radiochemical studies of the decay of this nucleus be undertaken to verify whether the predicted neutron emission is present. If such emission is present, it could have an expected probability of the order of 0.1% or less, comparing the predicted energy excess to that of Kr^{92}. It is also worth noting that in the previous paper,[1] the mass formulas considered here predict that As^{84} should be a precursor. Since the energy excess is of the order of 1 MeV, this nucleus should have a detectable neutron-emission probability (a few percent) by systematic comparisons with nearby nuclei, and should be studied to test the predictions.

According to the recent review article of Amiel,[7] it appears that most of the delayed neutron precursors with half-lives greater than about 0.5 sec have been identified. The known precursors account for nearly 95% of the 0.0158 delayed neutrons per fission of U^{235}.[7] There does not appear to be much value in searching further for delayed neutron precursors (aside from the suggestion that Y^{97} and As^{84} may be confirmed as precursors, adding more confidence to the mass-formula predictions). Rather, further studies into delayed neutron emission should lead to the understanding of the phenomenon of delayed neutron emission in an attempt to account for the observed neutron-emission probabilities and the appearance of the delayed neutron spectra.

The author is indebted to Dr. G. T. Garvey and Dr. I. Kelson for pointing out the error in tabulating the decay energies for the nuclei reported previously which, for their formula, resulted in erroneous mass-formula predictions in five cases.

[6] P. A. Seeger and R. C. Perisho, U.S. Atomic Energy Commission Report No. LA-3751, 1967 (unpublished).

[7] S. Amiel, in *Proceedings of the Second Symposium on the Physics and Chemistry of Fission* (International Atomic Energy Agency, Vienna, 1969), p. 569.