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**Memo CP-C/354**

**DATE:** January 31, 2005  
**TO:** Distribution  
**FROM:** V. McLane  
**SUBJECT:** Use of nuclide code SF7 (again) and addition to Dictionary 24

For data set C1118, transmitted in preliminary TRANS C071, it is difficult to specify the reaction. The problem: the cross section is given for the  $^{12}\text{C}$ - $^{12}\text{C}$  inelastic scattering, partially integrated from 40-95 degrees, as a function of the angle between the decay products ( $\alpha$  and  $^8\text{Be}$ ) from the 9.64 MeV level of  $^{12}\text{C}$ .

The best we can do is:

(6-C-12(6-C-12,INL)6-C-12,PAR,DA/DA,RSD+RSD/A+LCP,IPA)

ANG1 is the c.m. angle between the two scattered  $^{12}\text{C}$  nuclides, one in the excited state.

For this please add to Dictionary 24 (Field headings), please add:

ANG1-CM-MN Lower limit of 1<sup>st</sup> angle in c.m. system.

ANG1-CM-MX. Upper limit of 1<sup>st</sup> angle in c.m. system.

ANG2 is the angle between the decay alphas and decay product  $^8\text{Be}$ .

As it is we don't have a way to specify both of the  $^{12}\text{C}$  nuclides or the decay product  $^8\text{Be}$  in the reaction. We should reconsider using the nuclide code in SF7. The REACTION code would then be:

(6-C-12(6-C-12,INL)6-C-12,PAR,DA/DA,6-C-12+6-C-12/A+4-BE-8,IPA)

or (6-C-12(6-C-12,INL)6-C-12,PAR,DA/DA,C12+C12/A+BE8,IPA)

Alternately, we could introduce nuclide codes for scattering nucleus (SCN) and decay product (DCP). I think this solution will only delay the problem again.

Another problem is how to link (for the computer) the IPA to the correct angle, i.e., the angle between the  $^{12}\text{C}$  nuclides or the angle between the alpha and  $^8\text{Be}$ . One suggestion is that for partially integrated angles we should replace the DA,IPA with IPA in SF6.

(6-C-12(6-C-12,INL)6-C-12,PAR,IPA/DA,C12+C12/A+BE8)

Can anyone suggest something better?

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