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To: Distribution
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Subject: Use of REACTION combination

Below are examples of quantities which can be coded without reaction combination under certain conditions (e.g. incident energy):

a) Data for natural target = Sum data for all contributing target nuclide

```
(46-PD-0(P,X)45-RH-105-G,CUM,SIG)or
(46-PD-106(P,2P)45-RH-105-G,CUM,SIG,,A)+
(46-PD-108(P,X)45-RH-105-G,CUM,SIG,,A)+
(46-PD-110(P,X)45-RH-105-G,CUM,SIG,,A)
```

b) Inclusive cross section = Sum of exclusive cross section

```
(40-ZR-91(P,X)0-NN-1,,SIG) or
(40-ZR-91(P,N)41-NB-91,,SIG)+
(40-ZR-91(P,N+P)40-ZR-90,,SIG)+
(40-ZR-91(P,N+A)39-Y-87,,SIG)
```

c) Production = Sum of processes

```
(46-PD-102(P,X)46-PD-101,CUM,SIG) or
(46-PD-102(P,D)46-PD-101,CUM,SIG)+
(46-PD-102(P,N+P)46-PD-101,CUM,SIG)
```

d) Scattering = Elastic scattering + inelastic scattering

```
(3-LI-7(N,SCT)3-LI-7,PAR,SIG) or
(3-LI-7(N,EL)3-LI-7,,SIG)+(3-LI-7(N,INL)3-LI-7,PAR,SIG)
```

e) Alpha value = Capture cross section / fission cross section

```
(92-U-235(N,ABS),,ALF) or
(92-U-235(N,G)92-U-236,,SIG)/(92-U-235(N,F),,SIG)
```

f) Resonance strength (Capture kernel)

```
(82-PB-208(N,G)82-PB-209,,WID/STR) or
((82-PB-208(N,EL),,WID,,G)*(82-PB-208(N,G),,WID))/
(82-PB-208(N,TOT),,WID))
```

The EXFOR Formats Manual “Reaction Combinations” mentions that

> “Note that the reaction combination formalism is not used for certain frequently occurring sums, ratios, and products for which specific quantity codes have been introduced”

We propose to add above cases as examples of “frequently occurring sums, ratios, and products” into the Formats Manual to help users who want to find a given reaction/quantity easier.

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