Principal cross sections

![Graph showing cross sections vs energy]

- **Total**
- **Absorption**
- **Elastic**
- **Gamma production**
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section

Energy (MeV)

Cross section (barns)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section

Energy (MeV) vs. Cross section (barns) plot showing the total cross section profile for the specified energy range.
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
Energy (MeV)

Cross section (barns)

68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+ resonance absorption cross sections

![Graph showing cross section (barns) vs. energy (MeV). The graph has a linear scale for both axes. The cross section is given in a log-log scale, ranging from $10^{-5}$ to $10^{-4}$ barns on the y-axis and from $10^{-5}$ to $10^{-4}$ MeV on the x-axis. There is a smooth curve for the capture cross section.]
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections

Energy (MeV)

Cross section (barns)

![Graph of resonance absorption cross sections](image)

- Capture cross section

The graph shows the variation of cross sections with energy, indicating resonance peaks at different energy levels.
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections

capture

Cross section (barns)

Energy (MeV)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections

Energy (MeV) vs. Cross section (barns) graph

- Energy axis (MeV) ranges from $10^1$ to $10^2$
- Cross section axis (barns) ranges from $10^{-3}$ to $10^{-1}$

- Capture cross section curve is shown.

- The graph illustrates the capture cross section behavior as a function of energy.
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
UR total cross section

![Graph showing cross section (in barns) vs. energy (in MeV). The graph has three lines:
- Inf. Dil.
- 100 b
- 1 b
The cross section decreases as energy increases. The y-axis is labeled Cross section (barns), and the x-axis is labeled Energy (MeV).]
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
UR elastic cross section

![Graph showing elastic cross section vs energy (MeV)]
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
UR capture cross section

Energy (MeV)

Cross section (barns)

Inf. Dil.
100 b
1 b

Energy (MeV)
Non-threshold reactions

\[ \text{Cross section (barns)} \]

\[ \text{Energy (MeV)} \]

- \( (n,\text{gma}) \)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Heating

Heating (MeV/reaction) vs. Energy (MeV)

- Heating

Energy range from 0 to 200 MeV
Heating range from 0 to 35 MeV/reaction
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60
Damage

Damage (MeV-barns)

Energy (MeV)

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The graph shows the damage (in MeV-barns) as a function of energy (in MeV). The damage increases with energy, reaching a peak around 100 MeV before continuing to rise as the energy increases to 200 MeV.
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Non-threshold reactions

Cross section (barns)

Energy (MeV)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions

Energy (MeV)

Cross section (barns)

(n,x)  
(n,2n)  
(n,3n)  
(n,n*)a  
(n,n*)p  

Energy (MeV)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions

![Graph showing cross section (barns) vs. Energy (MeV) for various reactions: (n,n*)d, (n,n*c), (n,p), (n,d), (n,t).]
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions

![Graph showing the cross section (barns) as a function of energy (MeV) for the reaction (n,a).]
Threshold reactions

Cross section (barns) vs. Energy (MeV)

- (n,xp)
- (n,xd)
- (n,xt)
- (n,xhe3)
- (n,xa)
angular distribution for elastic
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for elastic
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*1)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*2)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*3)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*4)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+

angular distribution for (n,n^*)

10.0

1.0

0.5

0.0

-0.5

-1.0

Prob/Cos

0

4

6

8

10

12

14

16

18

20

EnergY (MeV)

Cosine

Prob/Cos
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*6)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*7)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*8)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*9)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*10)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*11)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for \( (n,n^{*12}) \)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*13)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*14)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*c)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,x)
Neutron emission for (n,2n)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,3n)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,n*)a

[3D plot showing neutron emission probabilities as a function of energy and secondary energy]
Neutron emission for (n,n*)p

Energy (MeV)

Sec. Energy

Prob/MeV

10^{-3}

10^{-1}

10

12

14

16

18

20
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for \((n,n^*c)\)
Photon emission for (n,2n)
Photon emission for (n,3n)
Photon emission for (n,n*)a
Photon emission for $\text{(n,n*)p}$
Photon emission for (n,n*c)
Photon emission for (n,gma)
Photon emission for (n,p)
Photon emission for (n,d)
Photon emission for (n,a)
Photon emission for (n,x)

68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
thermal capture photon spectrum
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
14 MeV photon spectrum

Gamma Energy (MeV)

Gamma Prod (barns/MeV)
Particle heating contributions

- Protons
- Deuterons
- Tritons
- He-3
- Alphas

Energy (MeV) vs. MeV/collision
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Particle production cross sections

![Graph showing particle production cross sections](image-url)

- **Protons**
- **Deuterons**
- **Tritons**
- **He-3**
- **Alphas**
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
protons from (n,x)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
deuterons from (n,x)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
tritons from (n,x)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
he3s from (n,x)
68-ER-170 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
alphas from (n,x)