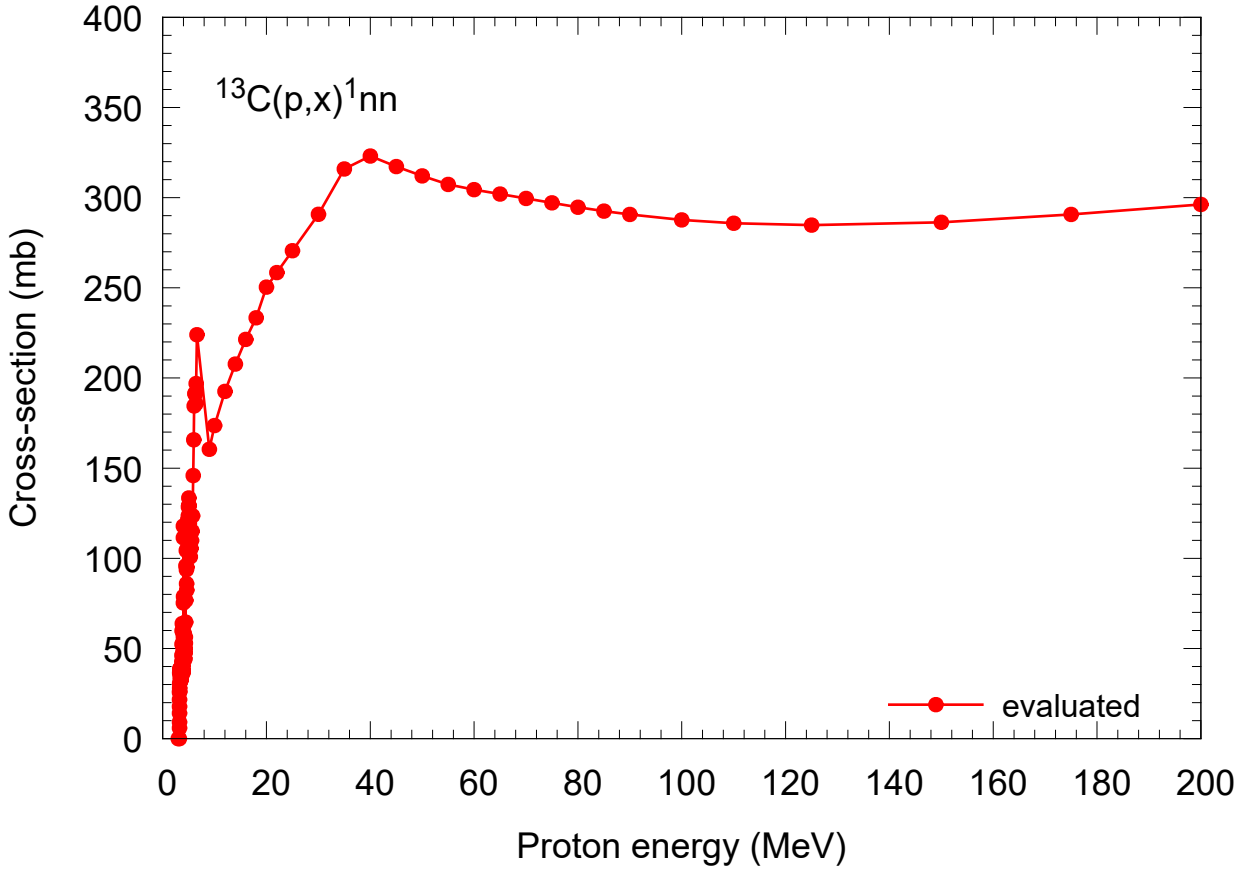
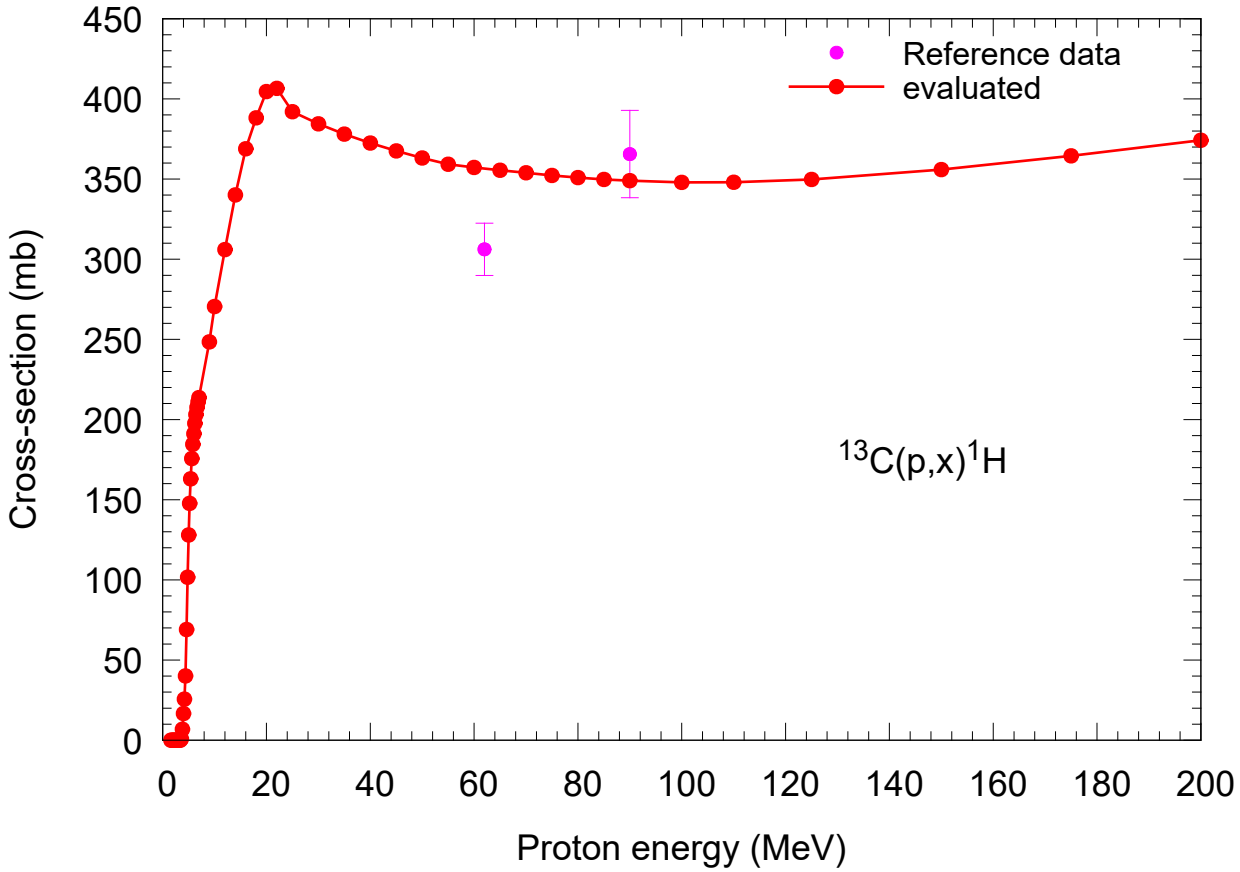
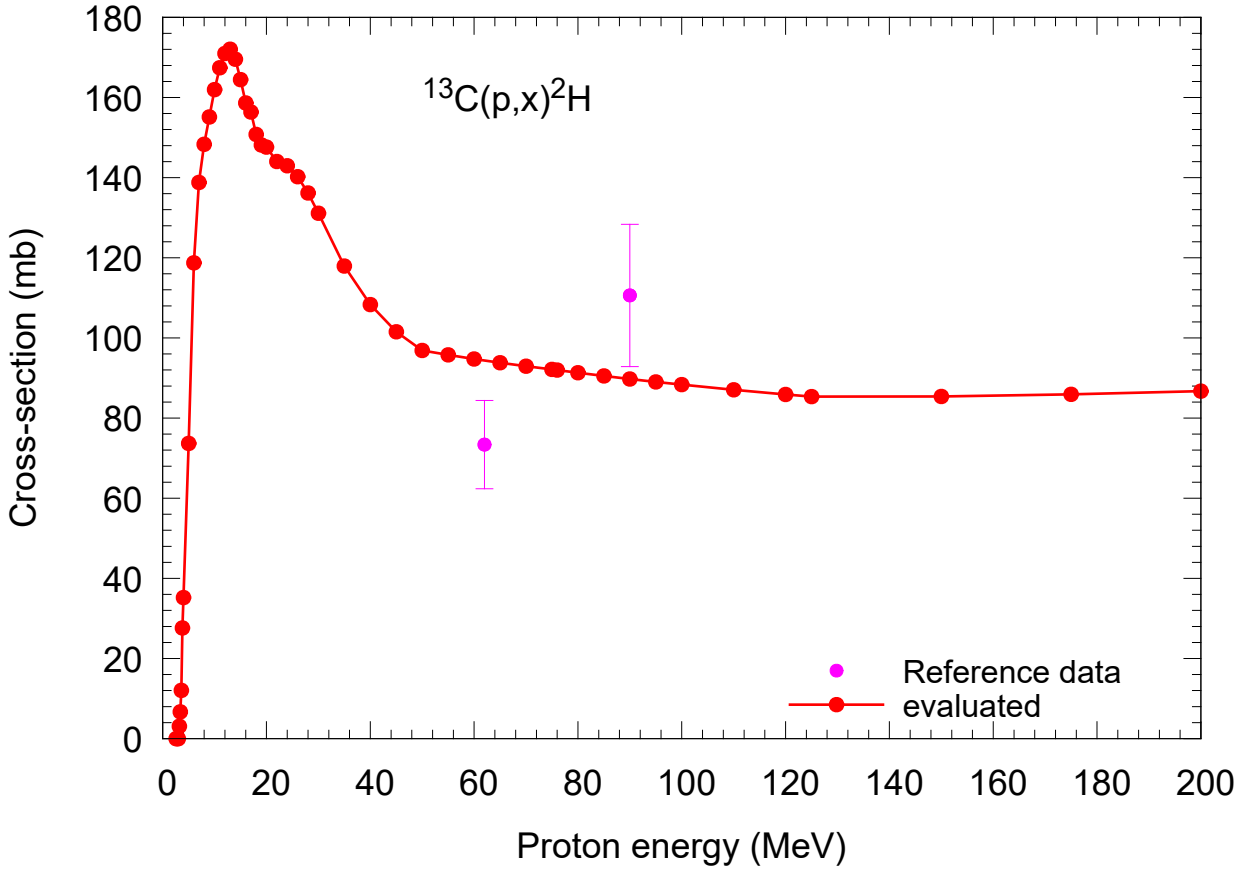
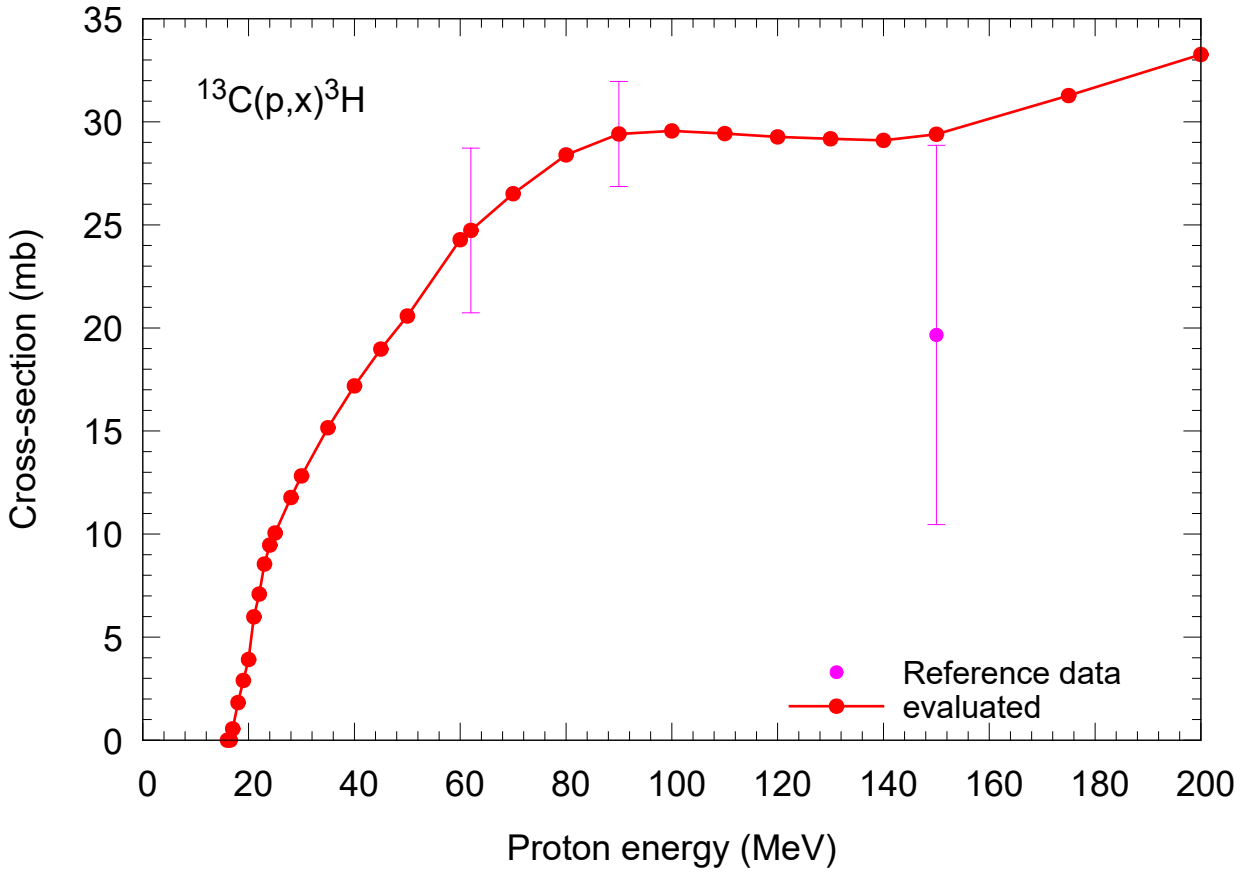
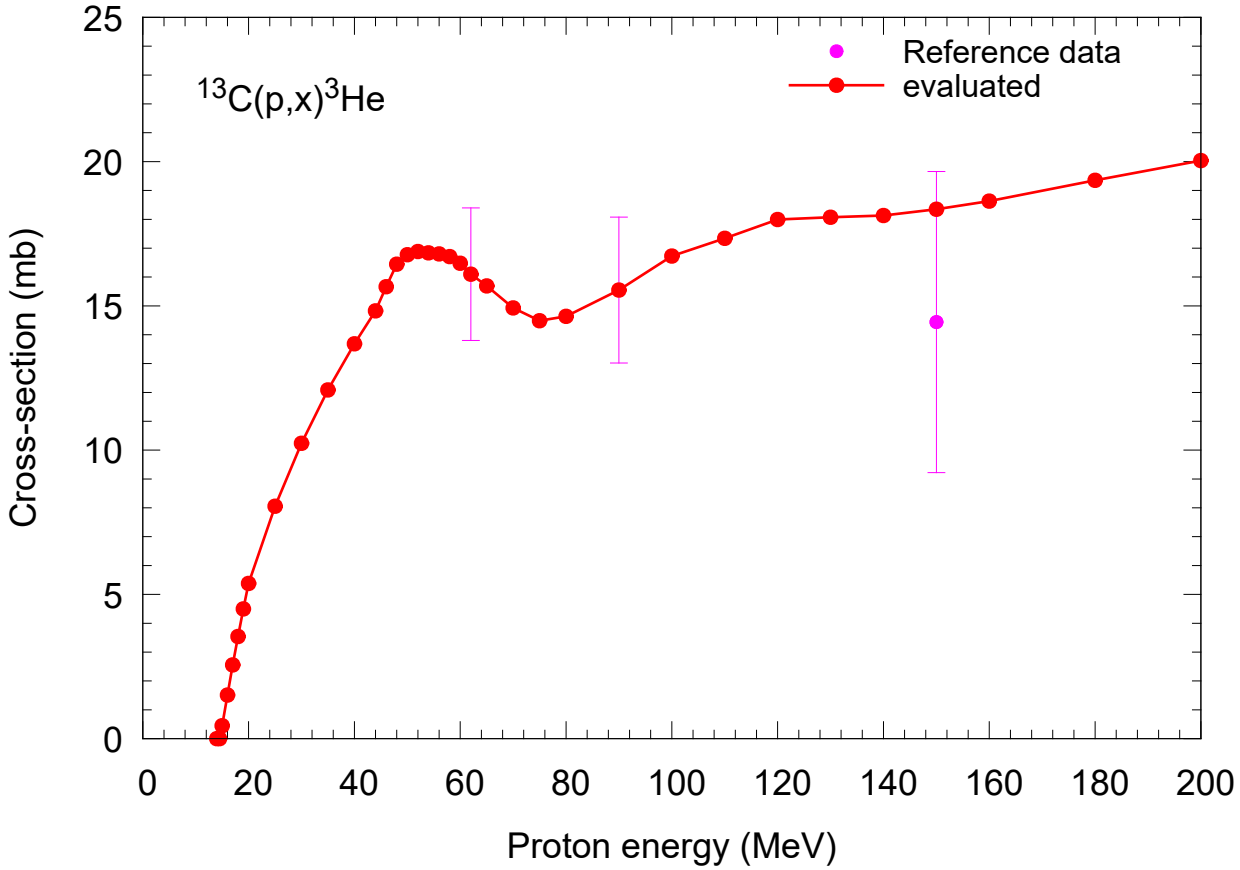
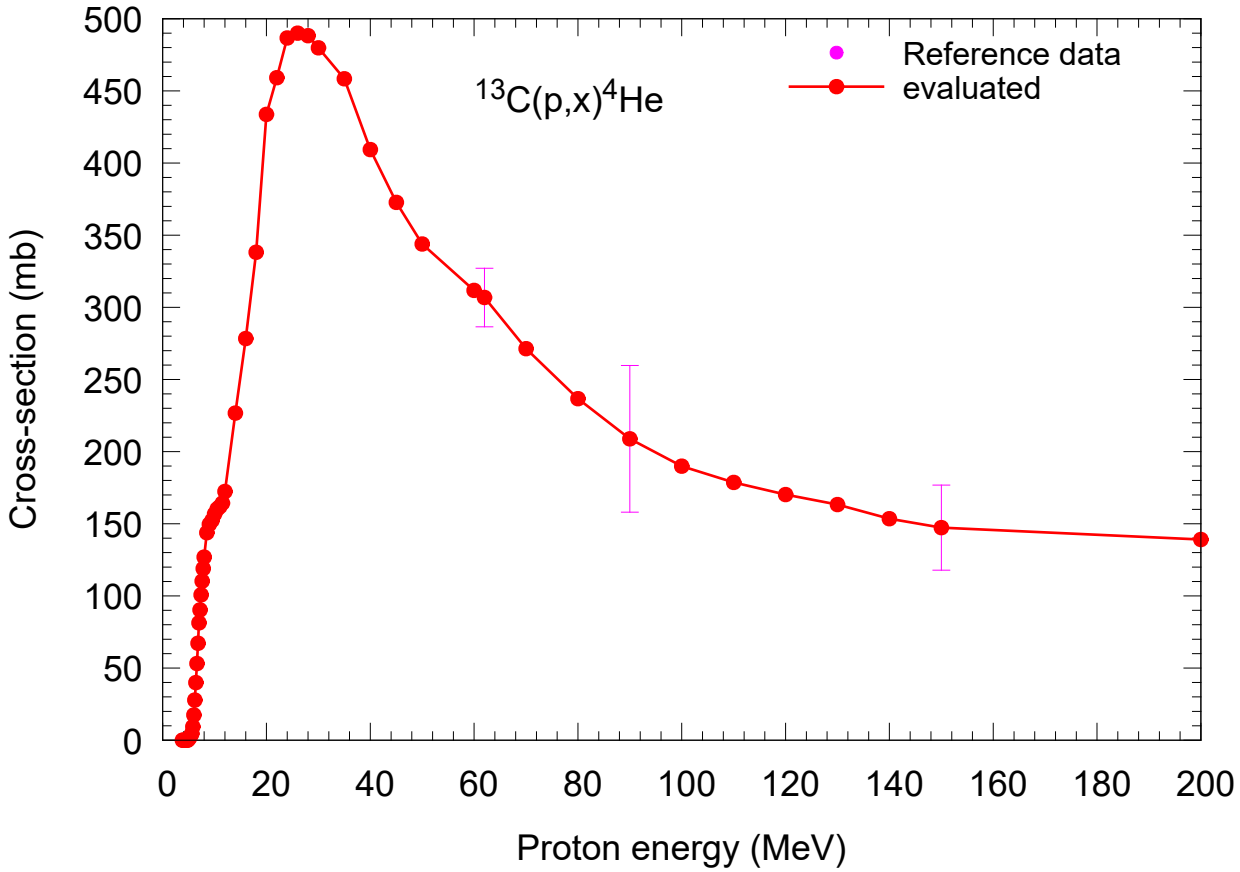

$^{13}C(p,x)^{1}nn$
evaluated
Cross-section (mb)
Proton energy (MeV)
0
50
100
150
200
250
300
350
400
0
20
40
60
80
100
120
140
160
180
200

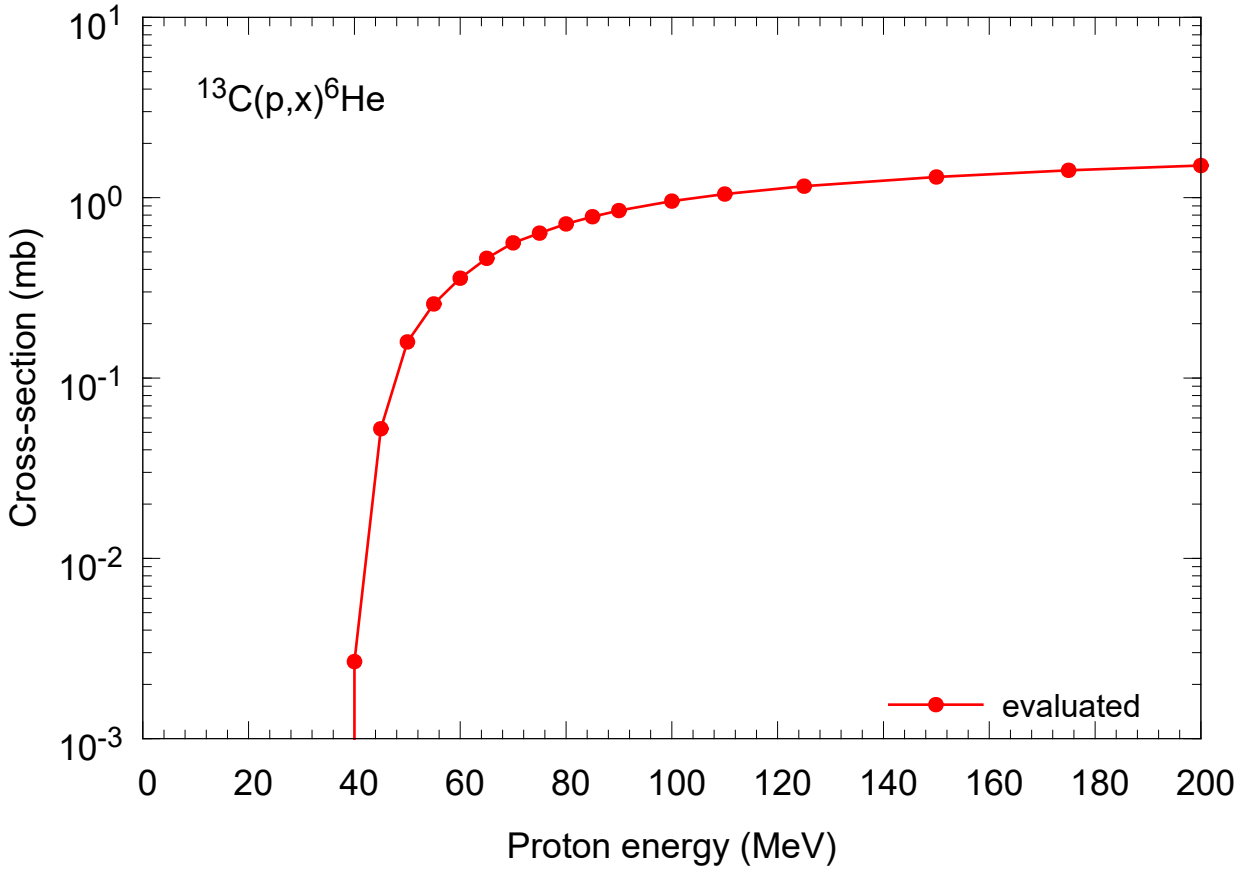

Reference data
evaluated
$^{13}C(p,x)^{1}H$
Cross-section (mb)
Proton energy (MeV)
0
50
100
150
200
250
300
350
400
450
0
20
40
60
80
100
120
140
160
180
200

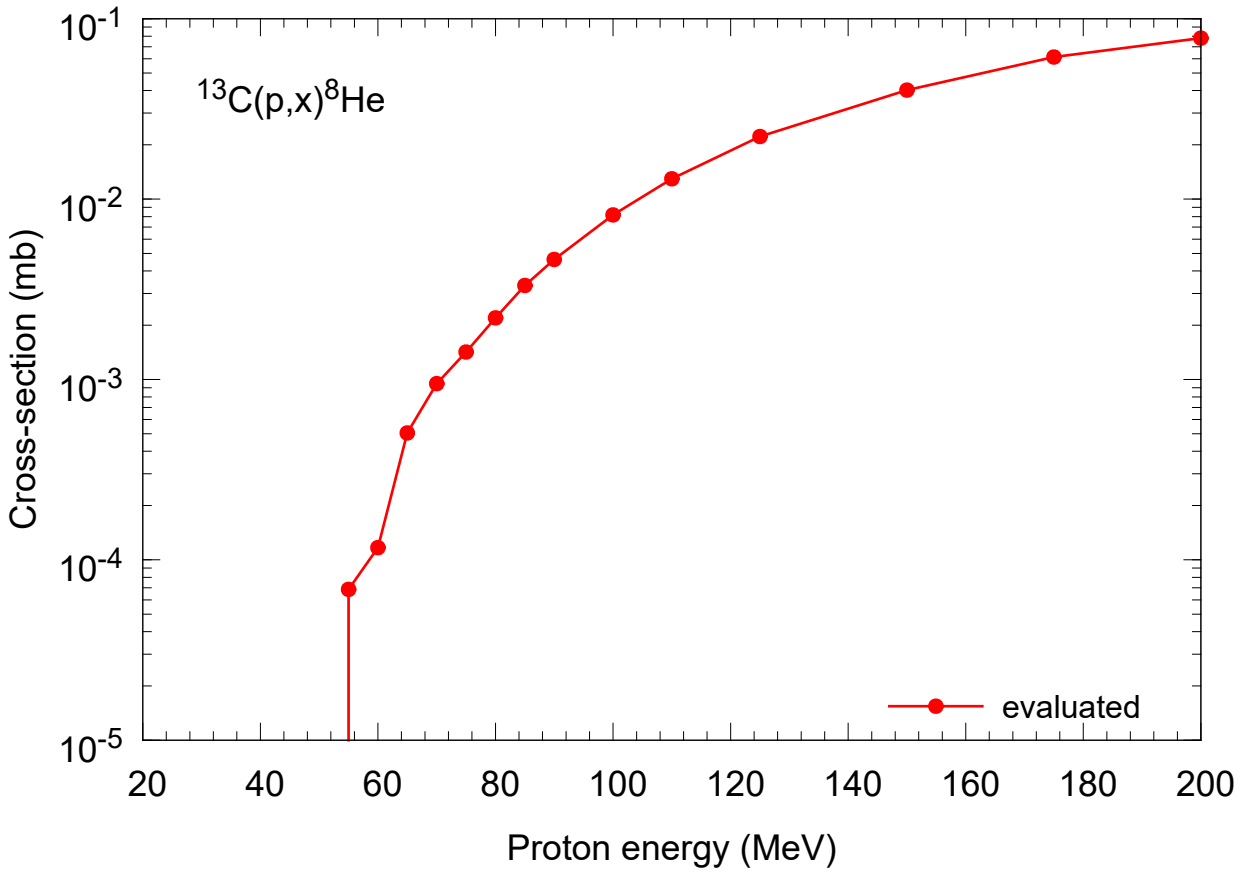

$^{13}C(p,x)^{2}H$
Cross-section (mb)
Proton energy (MeV)
Reference data
evaluated
0
20
40
60
80
100
120
140
160
180
200

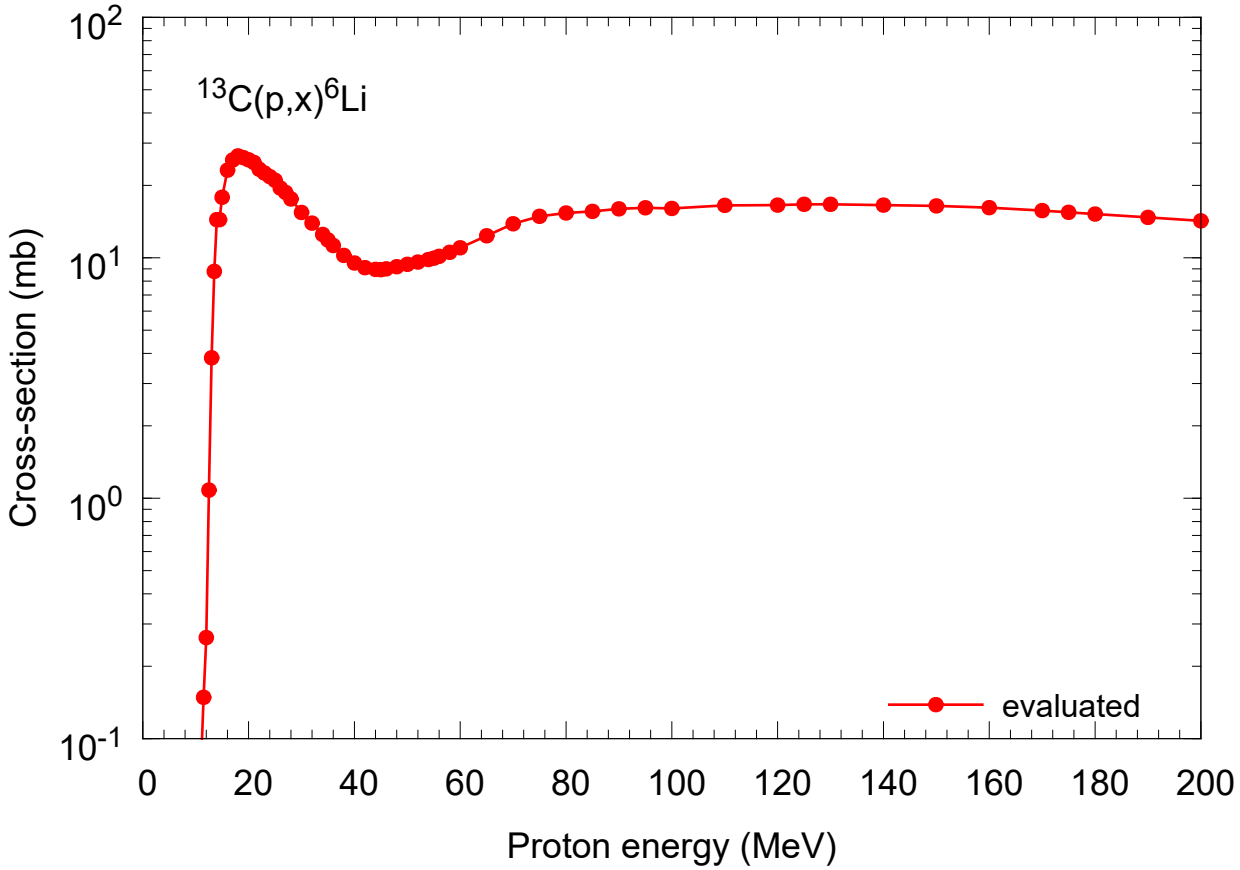

$^{13}C(p,x)^{3}H$
Cross-section (mb)
Proton energy (MeV)
Reference data
evaluated
0
5
10
15
20
25
30
35
40
60
80
100
120
140
160
180
200

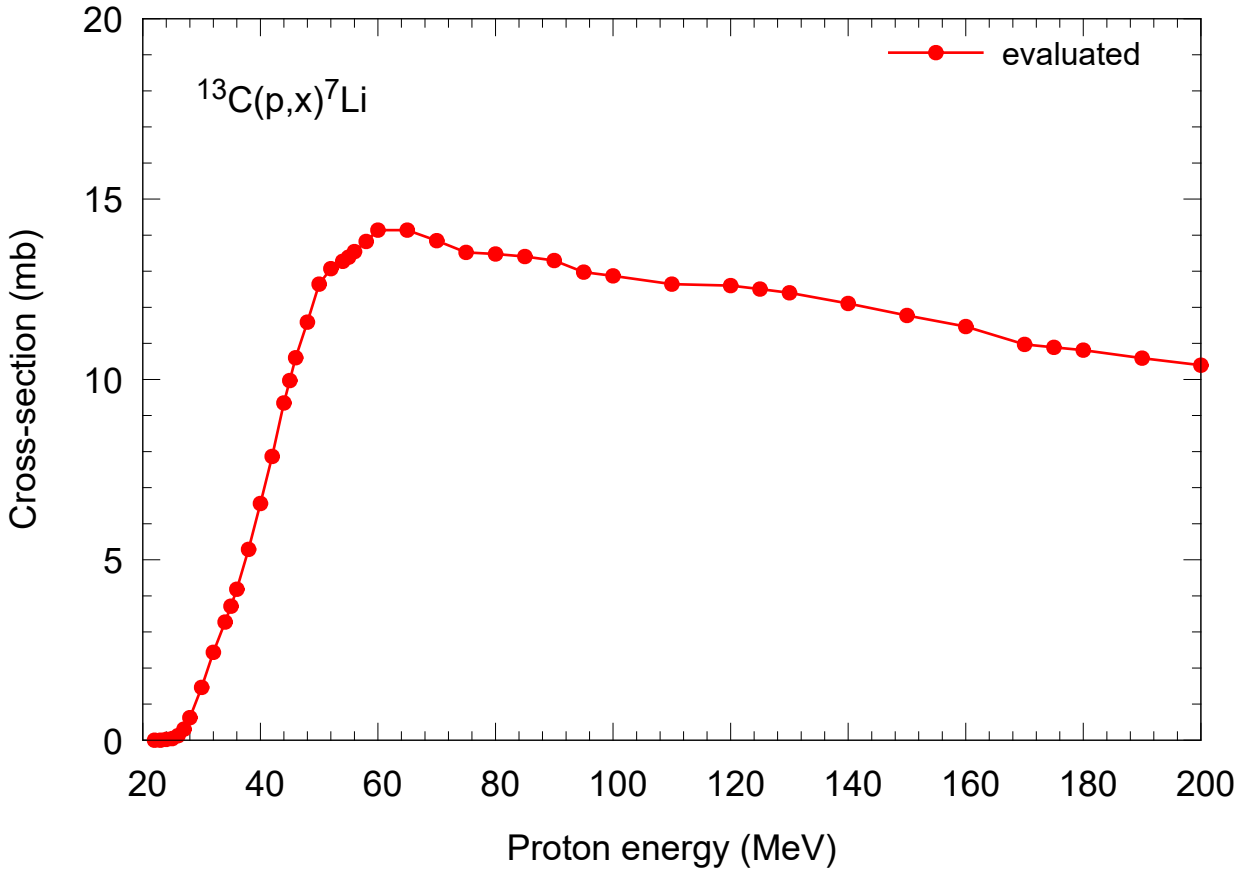

$^{13}C(p,x)^{3}He$
Reference data
evaluated
Cross-section (mb)
Proton energy (MeV)
0
5
10
15
20
25
0
20
40
60
80
100
120
140
160
180
200

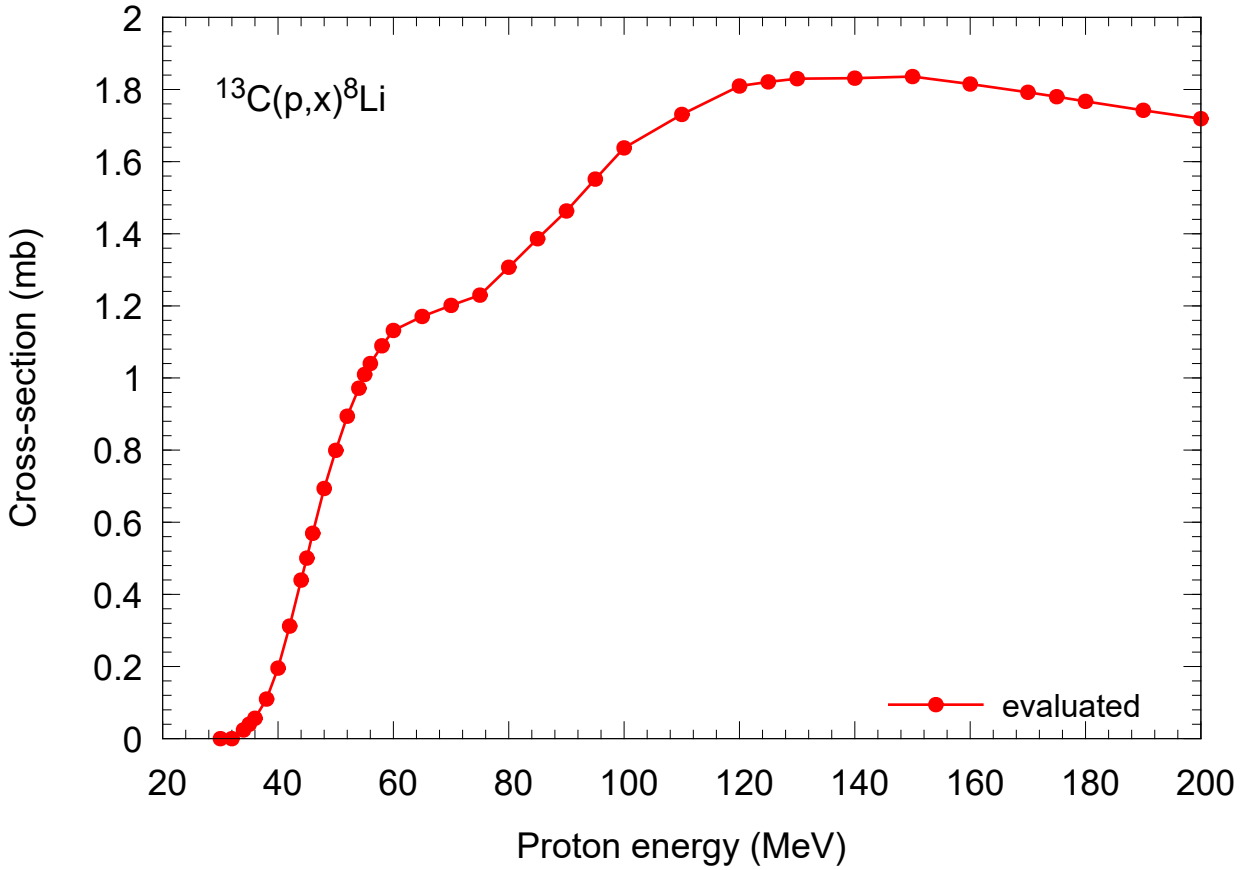

$^{13}C(p,x)^{4}He$
Reference data
evaluated
Cross-section (mb)
Proton energy (MeV)
0
50
100
150
200
250
300
350
400
450
500
0
20
40
60
80
100
120
140
160
180
200

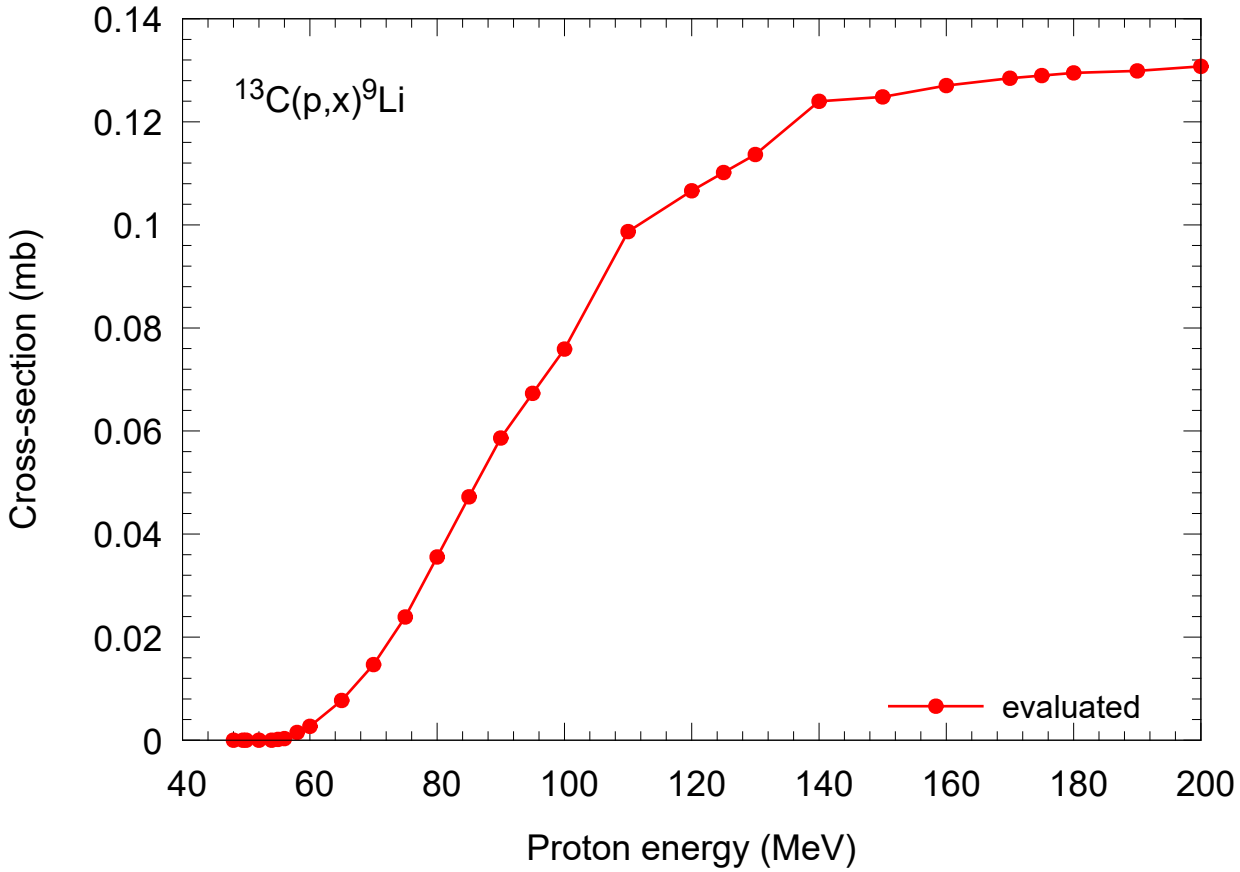

$^{13}C(p,x)^{6}He$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
0
20
40
60
80
100
120
140
160
180
200

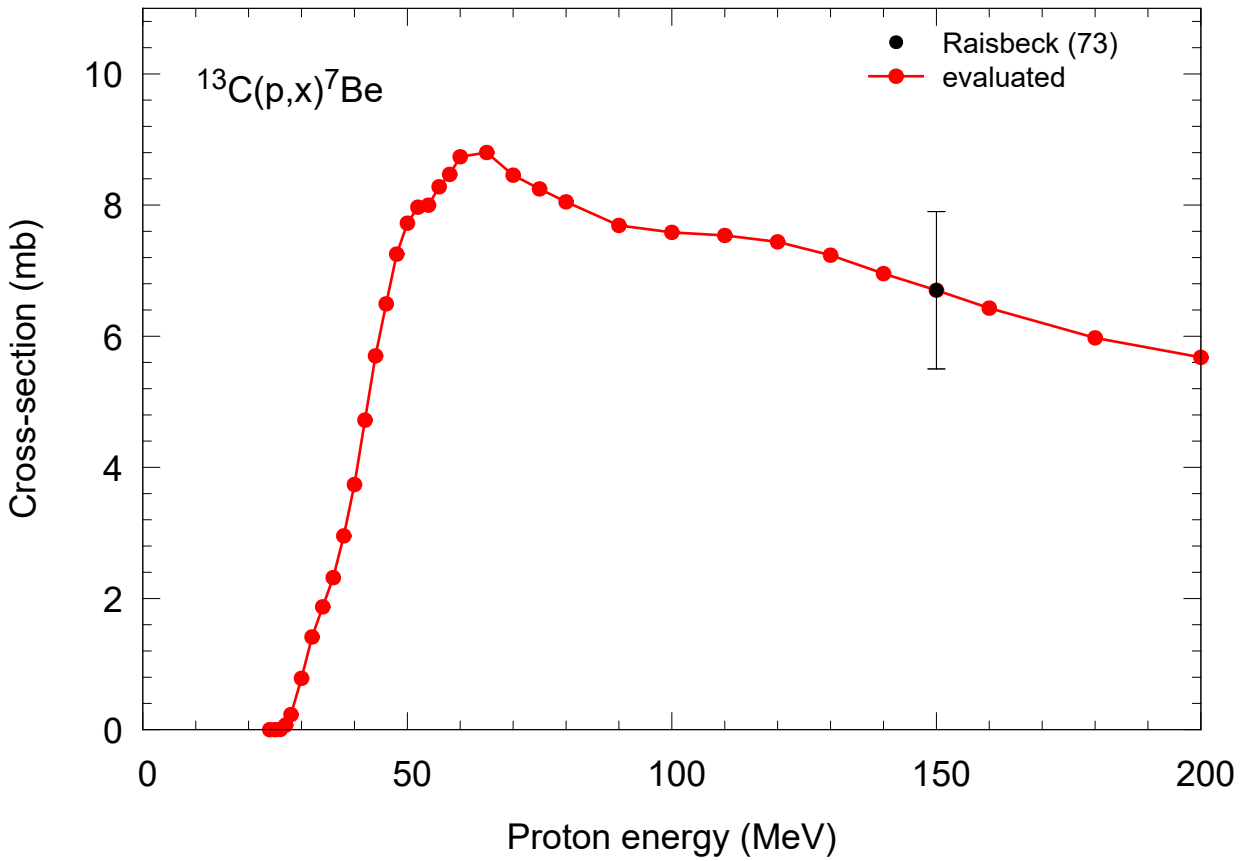

$^{13}C(p,x)^{8}He$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
20
40
60
80
100
120
140
160
180
200

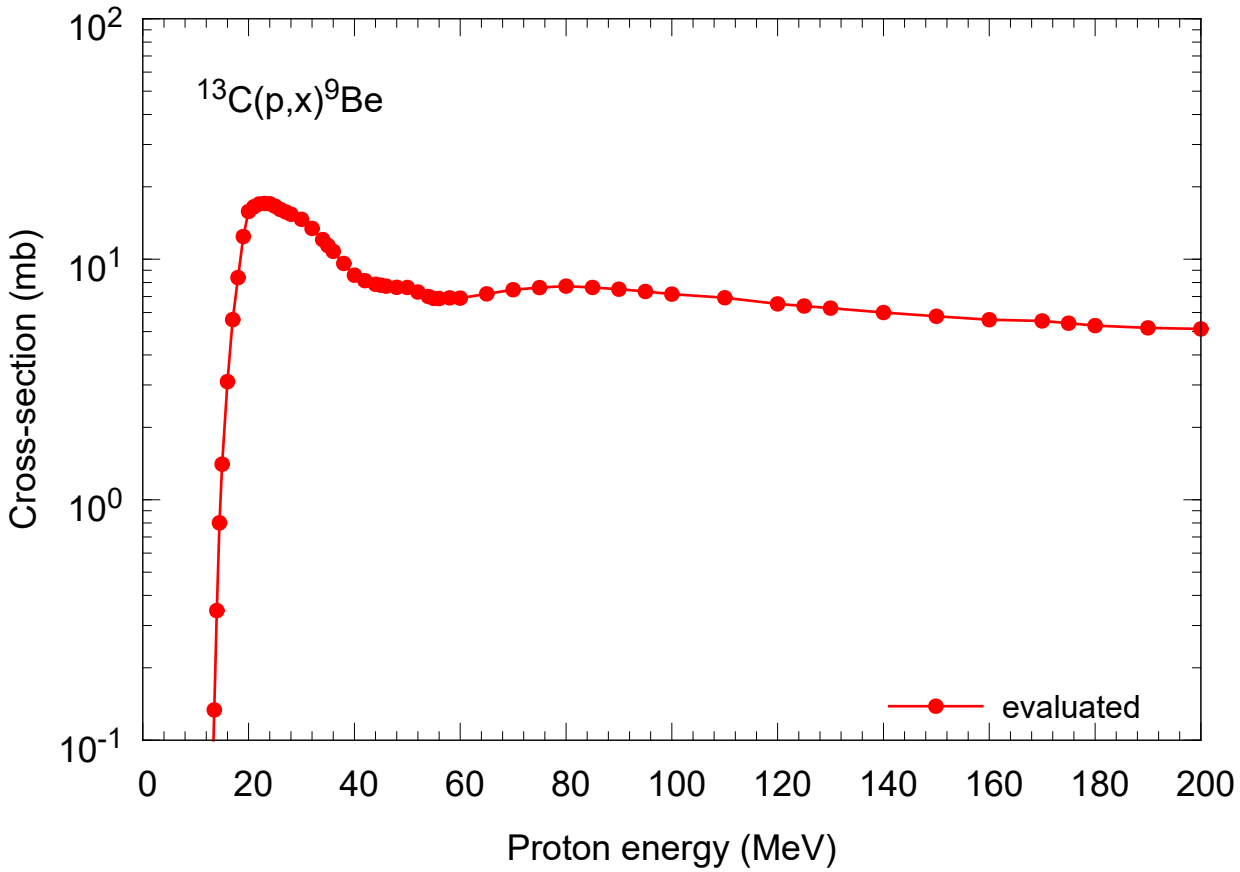

$^{13}C(p,x)^{6}Li$
evaluated
Cross-section (mb)
Proton energy (MeV)
10^{2}
10^{1}
10^{0}
10^{-1}
0
20
40
60
80
100
120
140
160
180
200

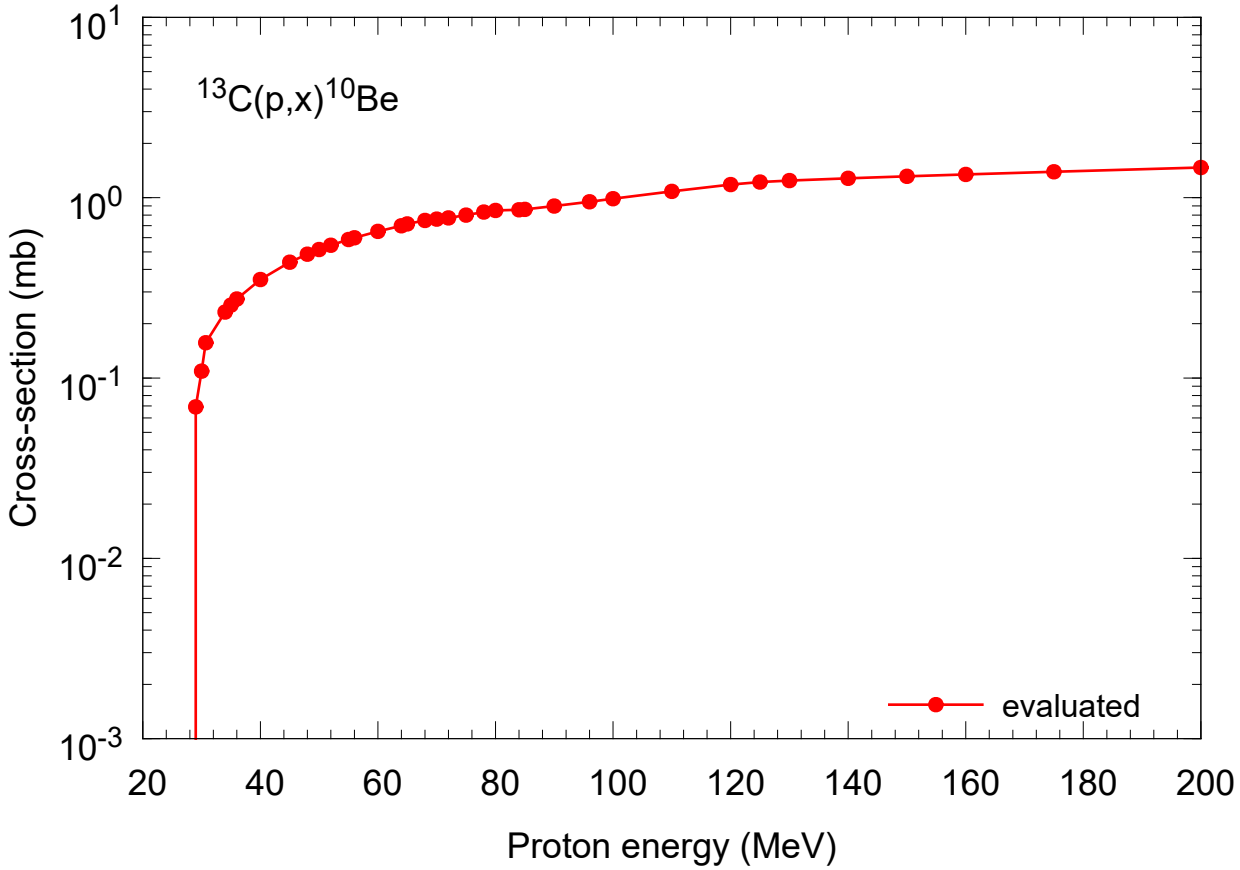

$^{13}C(p,x)^{7}Li$
evaluated
Cross-section (mb)
Proton energy (MeV)
20
15
10
5
0
20
40
60
80
100
120
140
160
180
200

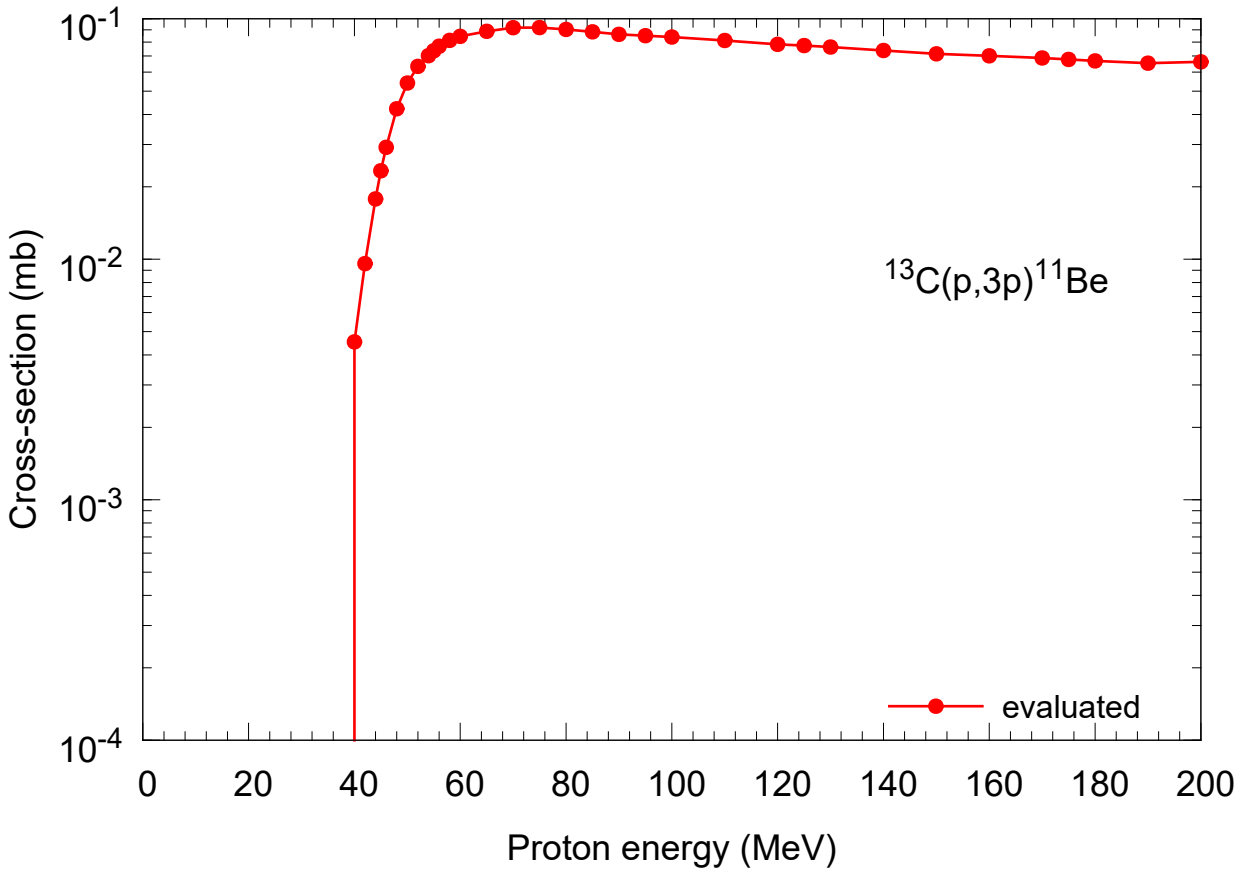

$^{13}C(p,x)^{8}Li$
Cross-section (mb)
Proton energy (MeV)
evaluated
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
20
40
60
80
100
120
140
160
180
200

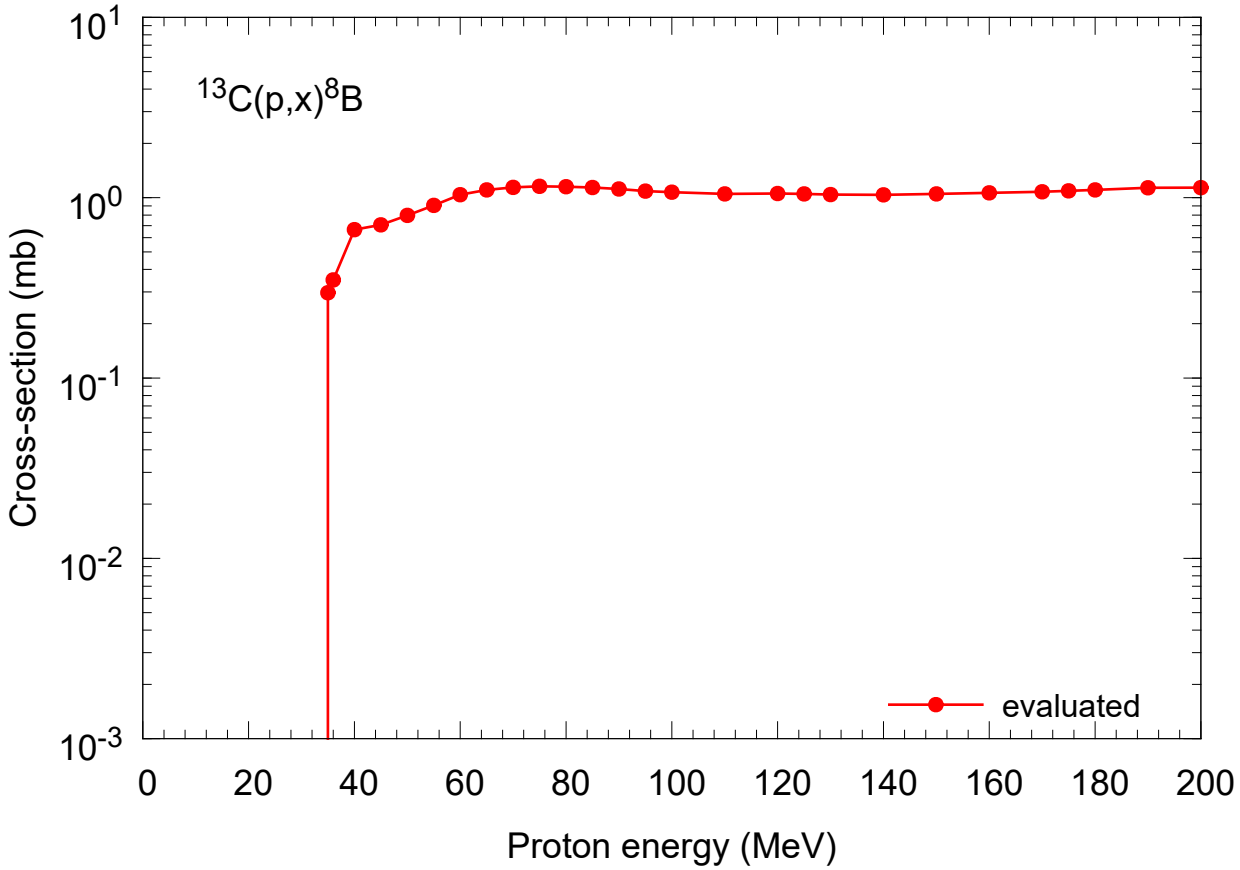

$^{13}C(p,x)^{9}Li$
Cross-section (mb)
Proton energy (MeV)
evaluated
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
40
60
80
100
120
140
160
180
200

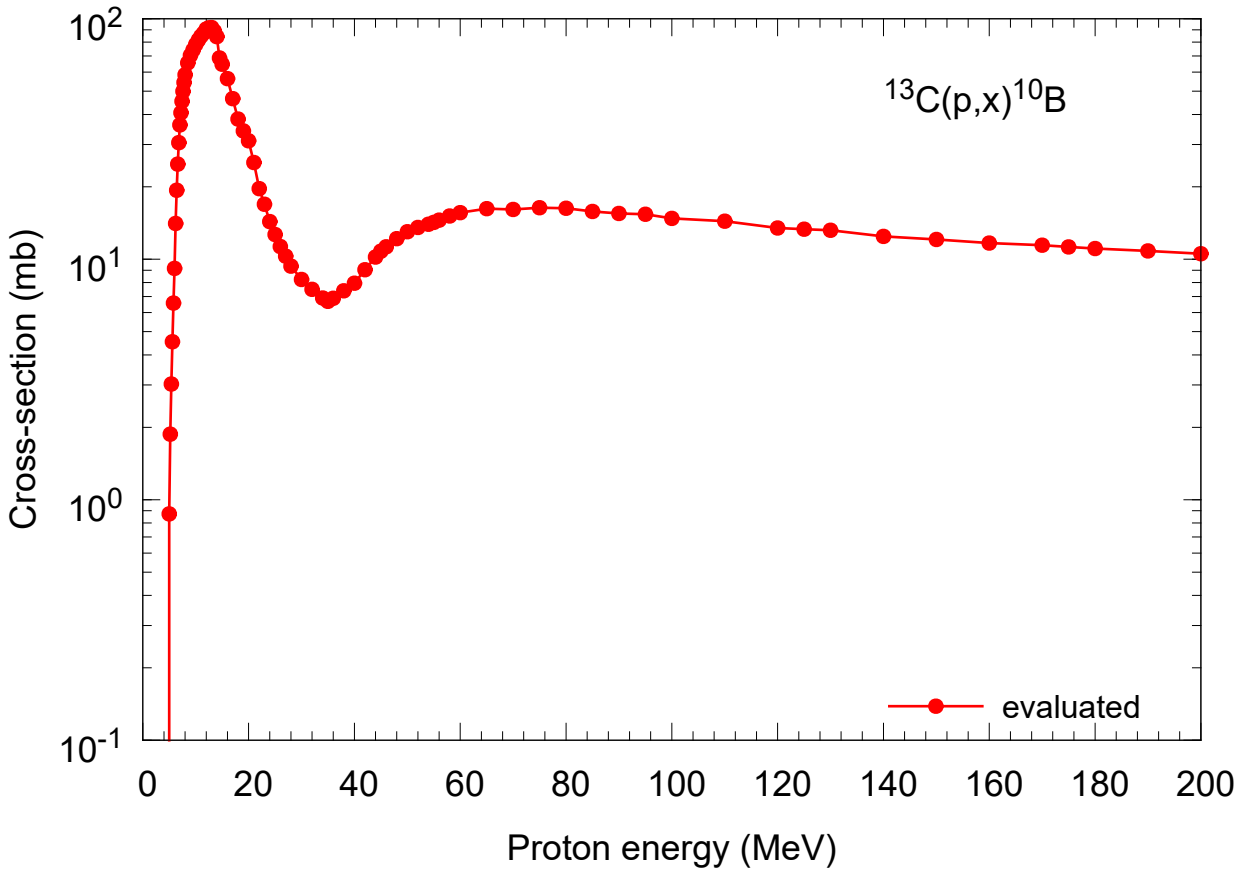

$^{13}C(p,x)^{7}Be$
Raisbeck (73)
evaluated
Cross-section (mb)
Proton energy (MeV)
0
2
4
6
8
10
0
50
100
150
200

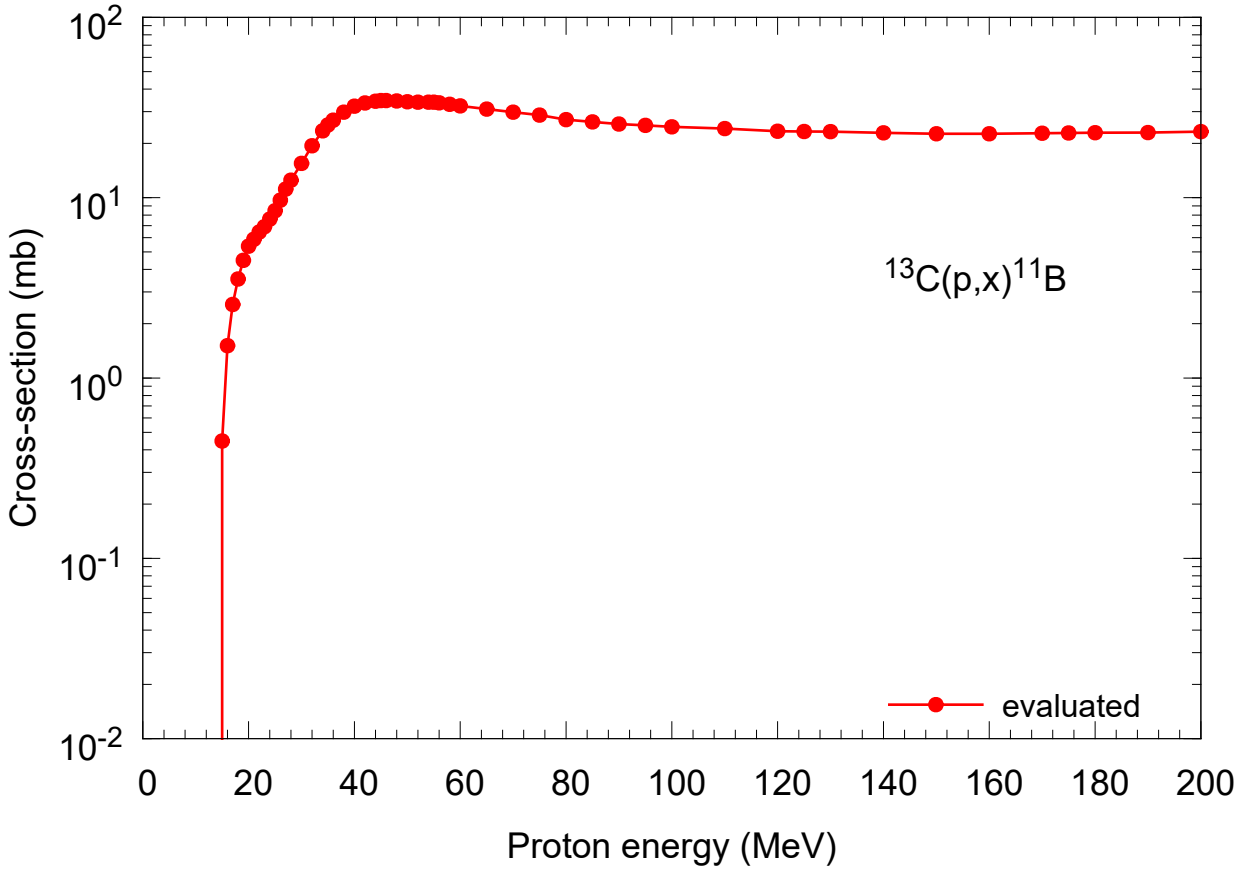

$^{13}C(p,x)^{9}Be$
evaluated
Cross-section (mb)
Proton energy (MeV)
10^{2}
10^{1}
10^{0}
10^{-1}
0
20
40
60
80
100
120
140
160
180
200

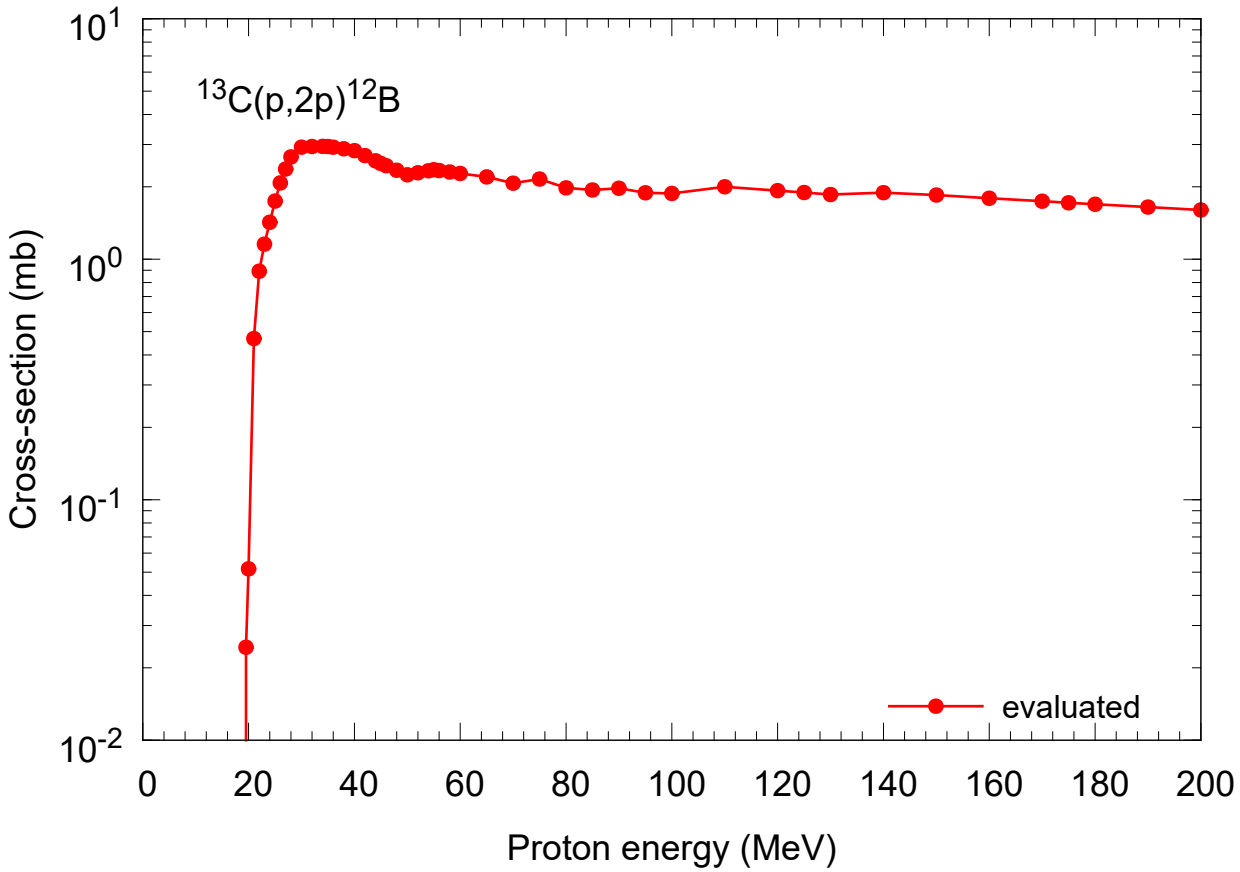

$^{13}C(p,x)^{10}Be$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
20
40
60
80
100
120
140
160
180
200

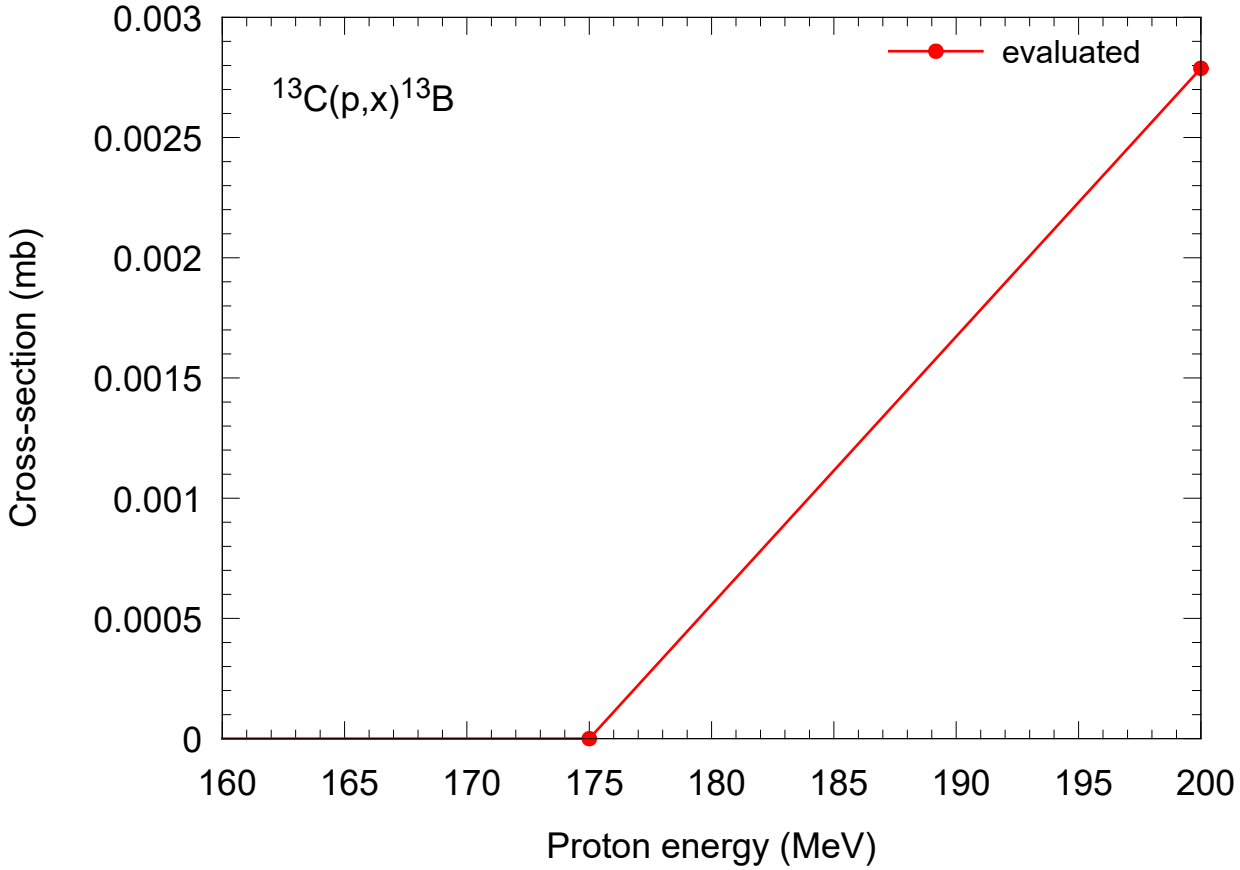

$^{13}C(p,3p)^{11}Be$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{-1}
10^{-2}
10^{-3}
10^{-4}
0
20
40
60
80
100
120
140
160
180
200

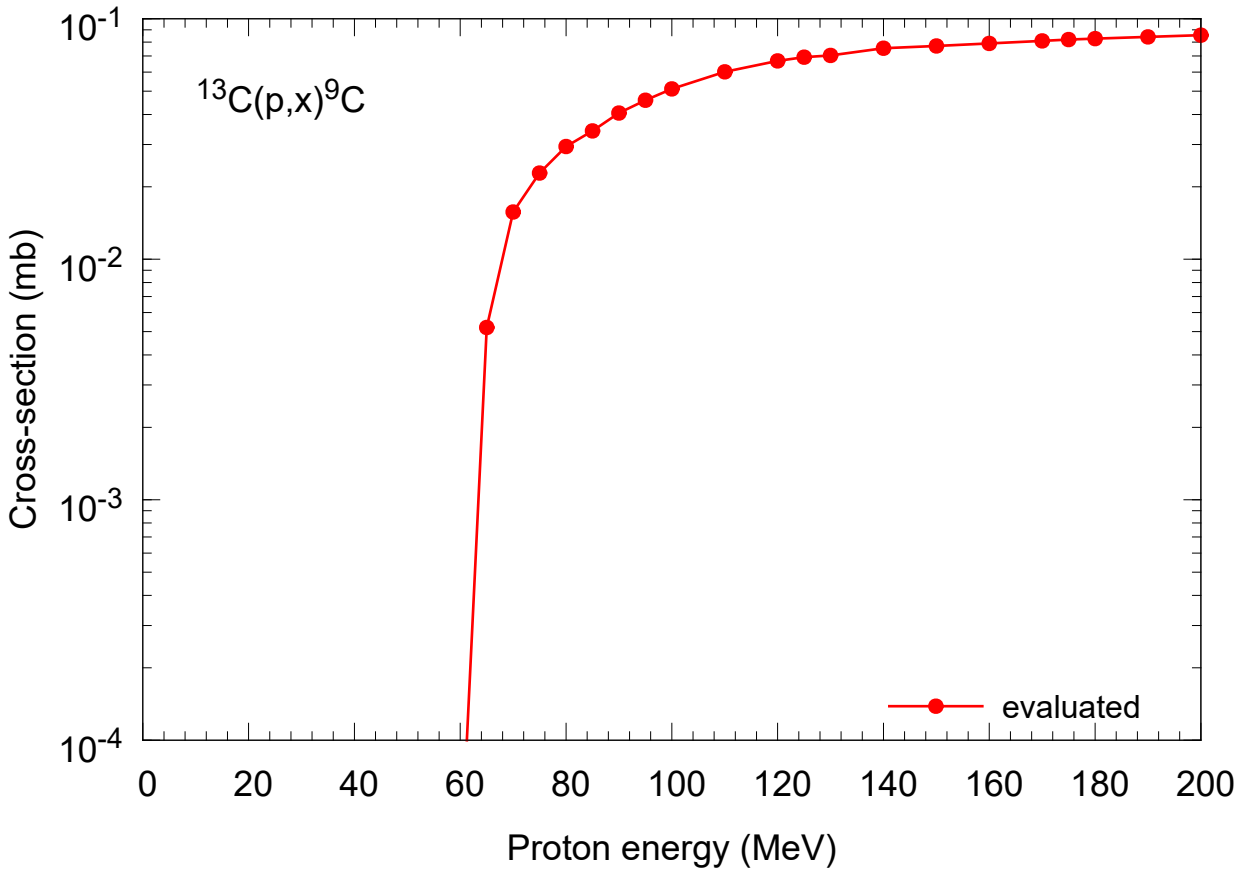

$^{13}C(p,x)^{8}B$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
0
20
40
60
80
100
120
140
160
180
200

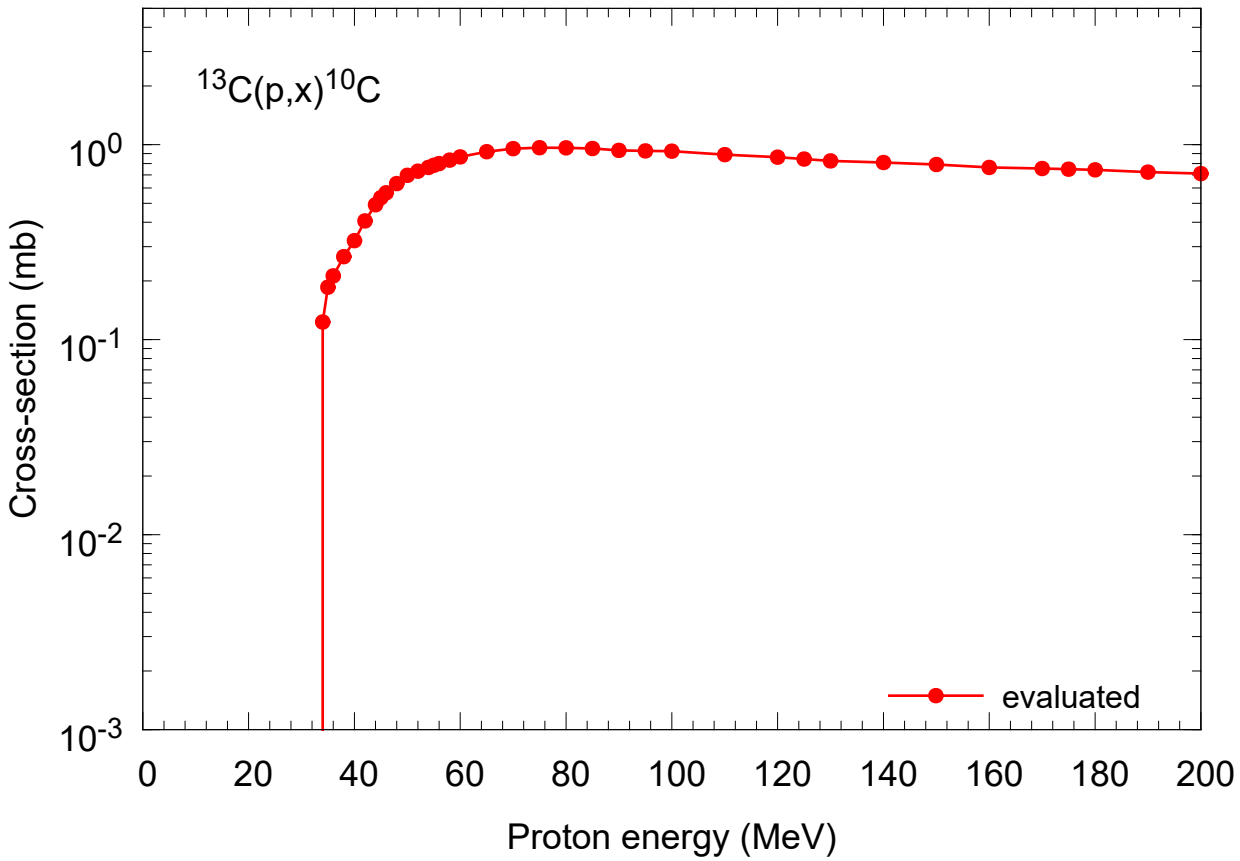

$^{13}C(p,x)^{10}B$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{2}
10^{1}
10^{0}
10^{-1}
0
20
40
60
80
100
120
140
160
180
200

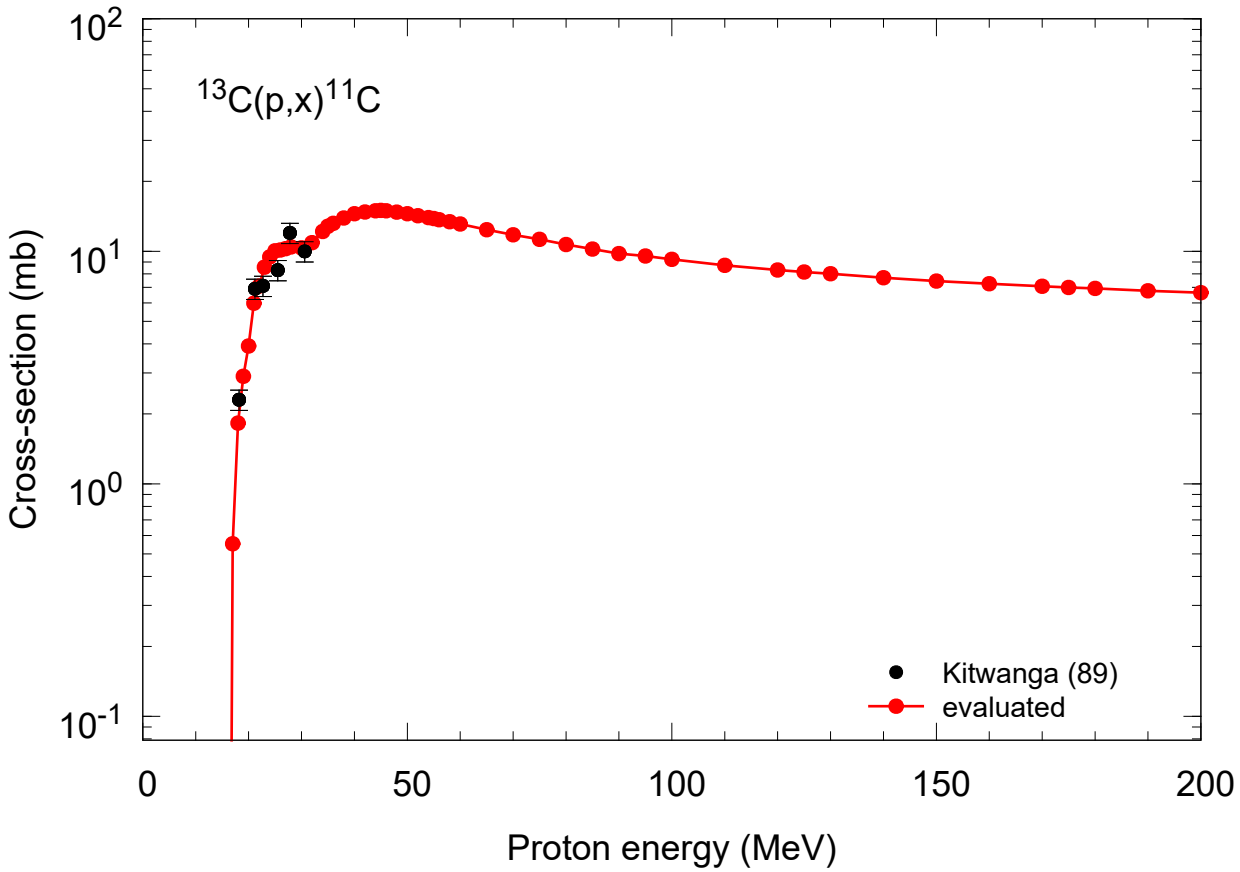

10^2
10^1
10^0
10^{-1}
10^{-2}
Cross-section (mb)
$^{13}C(p,x)^{11}B$
evaluated
0
20
40
60
80
100
120
140
160
180
200
Proton energy (MeV)

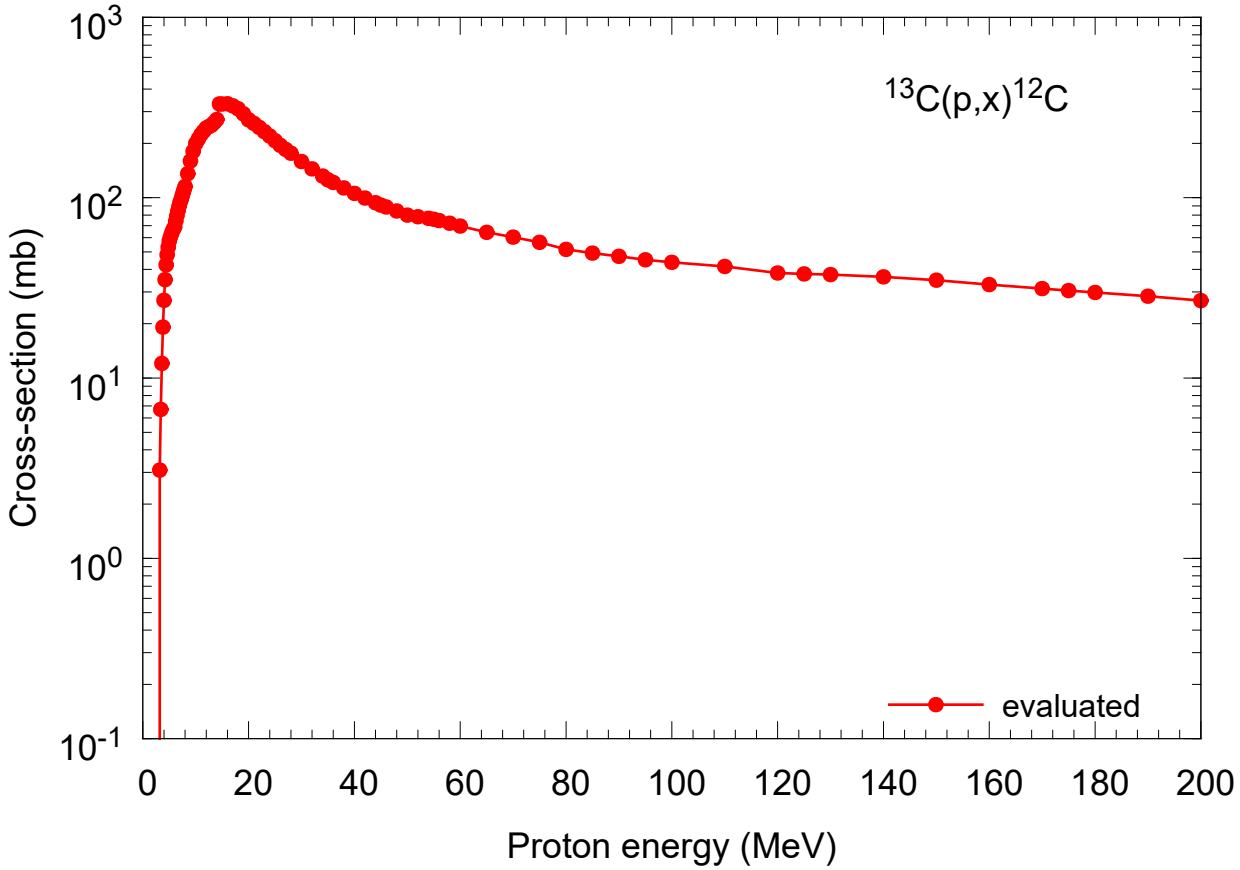

10^1
10^0
10^{-1}
10^{-2}
Cross-section (mb)
$^{13}C(p,2p)^{12}B$
evaluated
0
20
40
60
80
100
120
140
160
180
200
Proton energy (MeV)

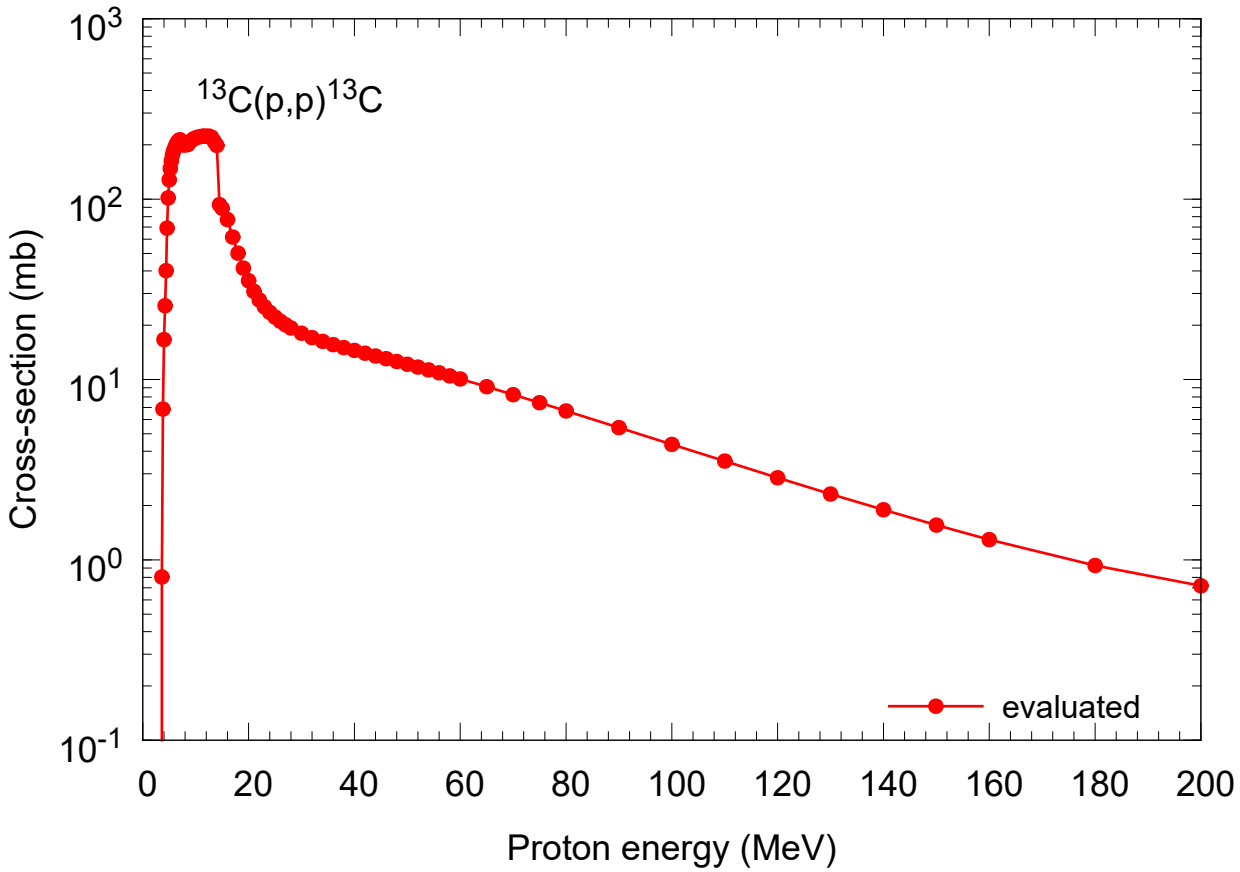

0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Cross-section (mb)
160
165
170
175
180
185
190
195
200
Proton energy (MeV)
evaluated
13C(p,x)13B

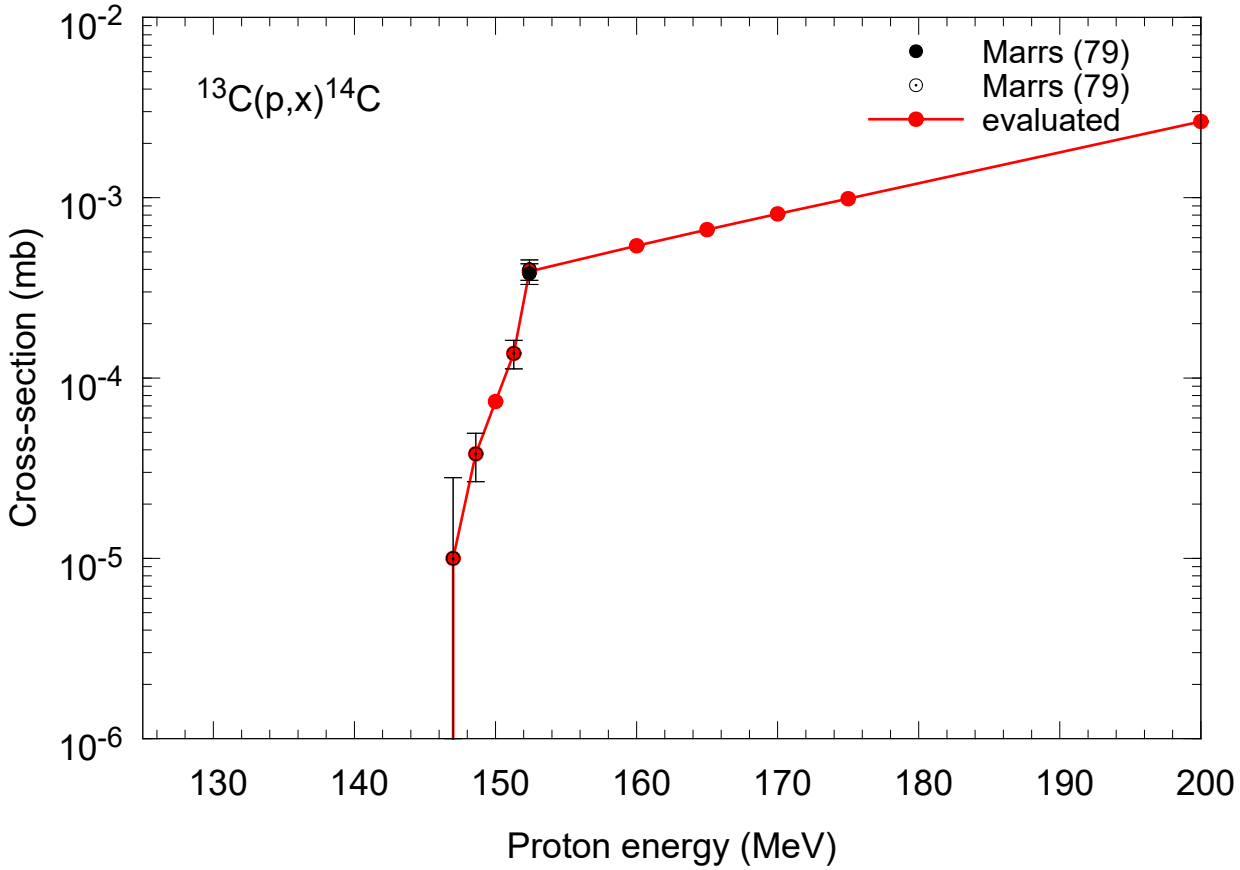

10-1
10-2
10-3
10-4
Cross-section (mb)
0
20
40
60
80
100
120
140
160
180
200
Proton energy (MeV)
evaluated
13C(p,x)9C

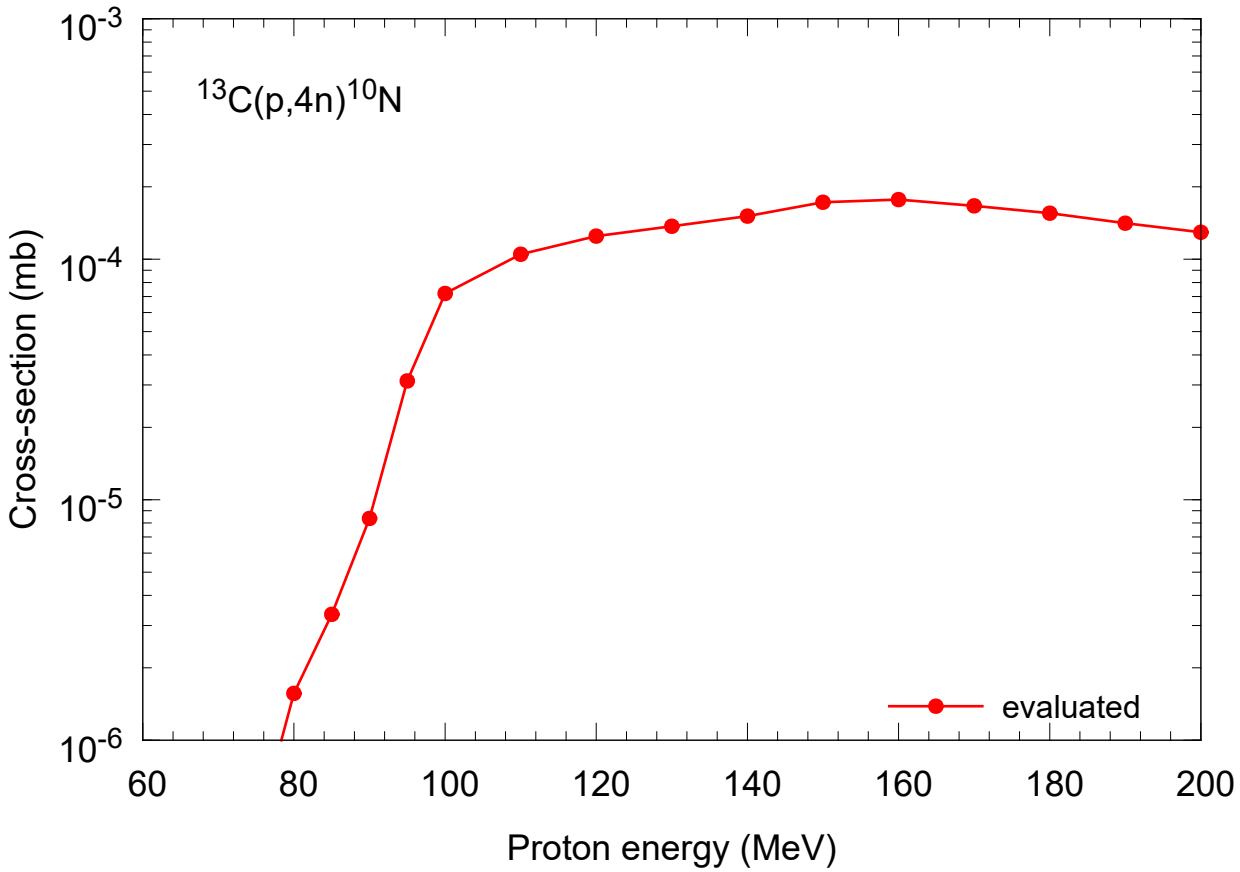

$^{13}C(p,x)^{10}C$
Cross-section (mb)
10^0
10^{-1}
10^{-2}
10^{-3}
0
20
40
60
80
100
120
140
160
180
200
Proton energy (MeV)
evaluated

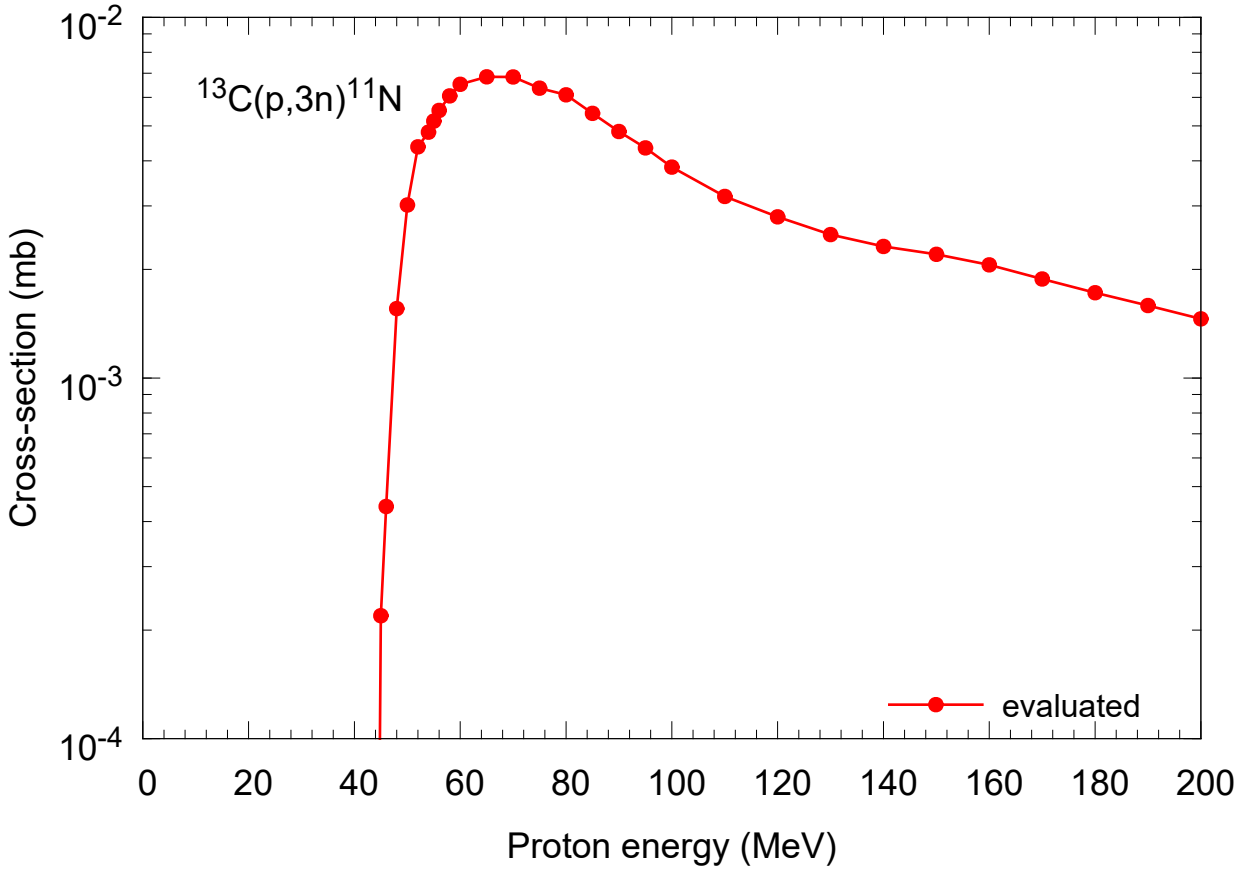

$^{13}C(p,x)^{11}C$
Cross-section (mb)
10^2
10^1
10^0
10^{-1}
0
50
100
150
200
Proton energy (MeV)
Kitwanga (89)
evaluated

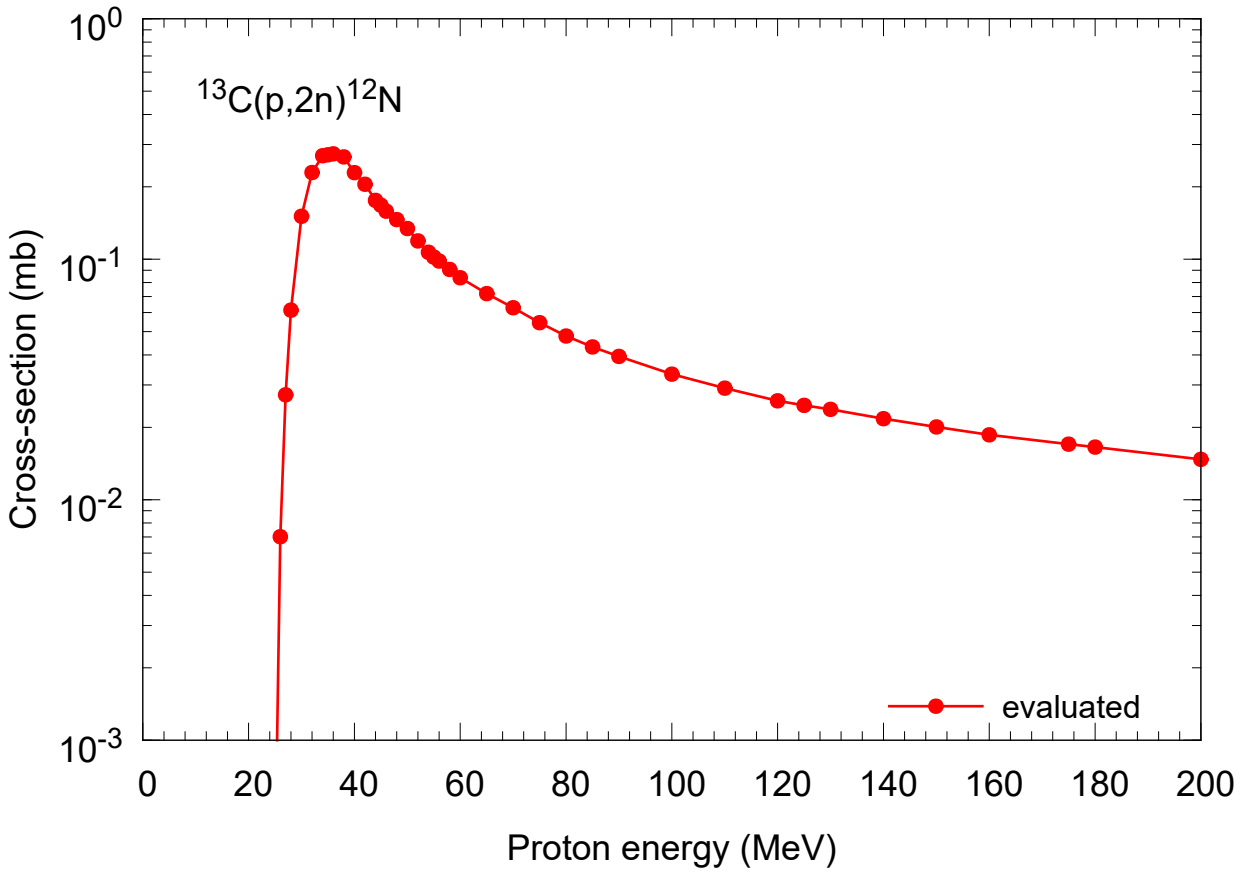

$^{13}C(p,x)^{12}C$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{3}
10^{2}
10^{1}
10^{0}
10^{-1}
0
20
40
60
80
100
120
140
160
180
200

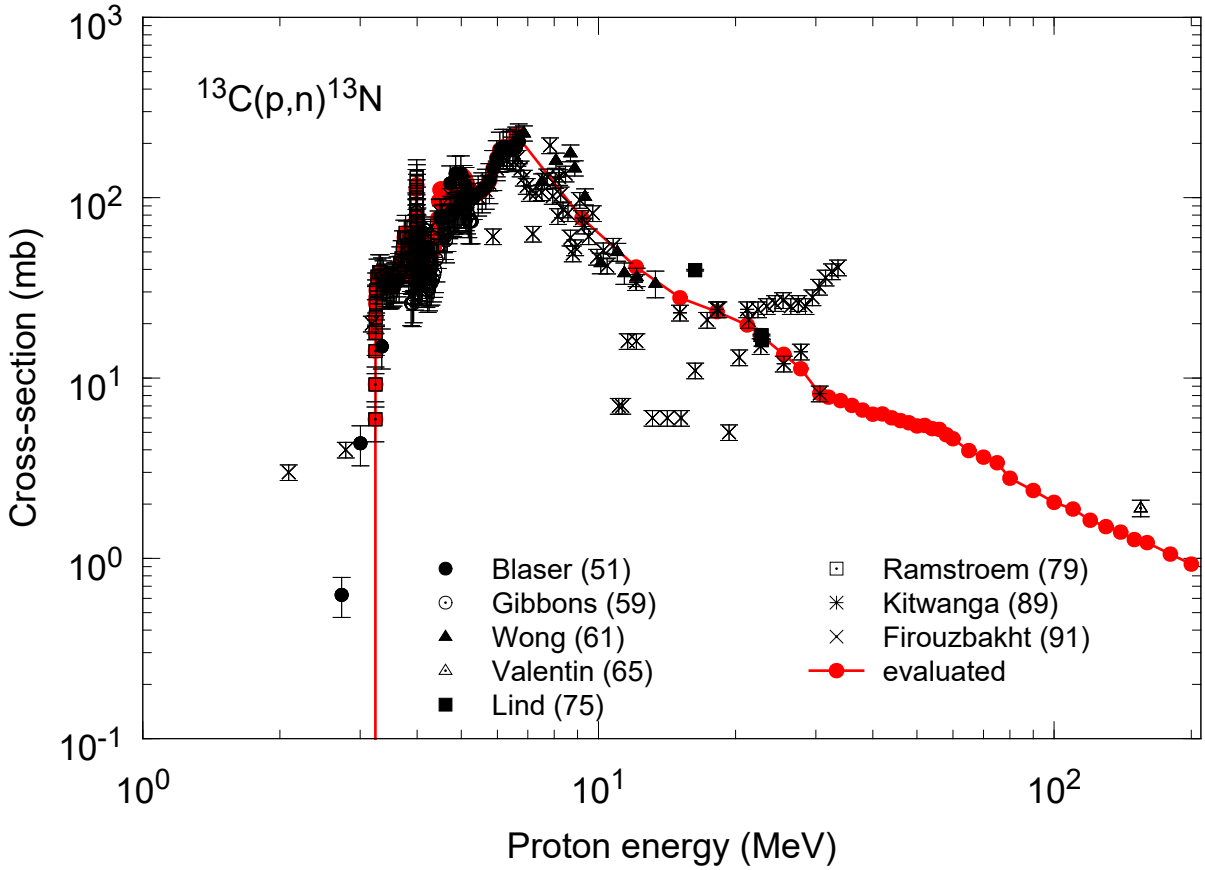

$^{13}C(p,p)^{13}C$
Cross-section (mb)
Proton energy (MeV)
evaluated
10^{3}
10^{2}
10^{1}
10^{0}
10^{-1}
0
20
40
60
80
100
120
140
160
180
200

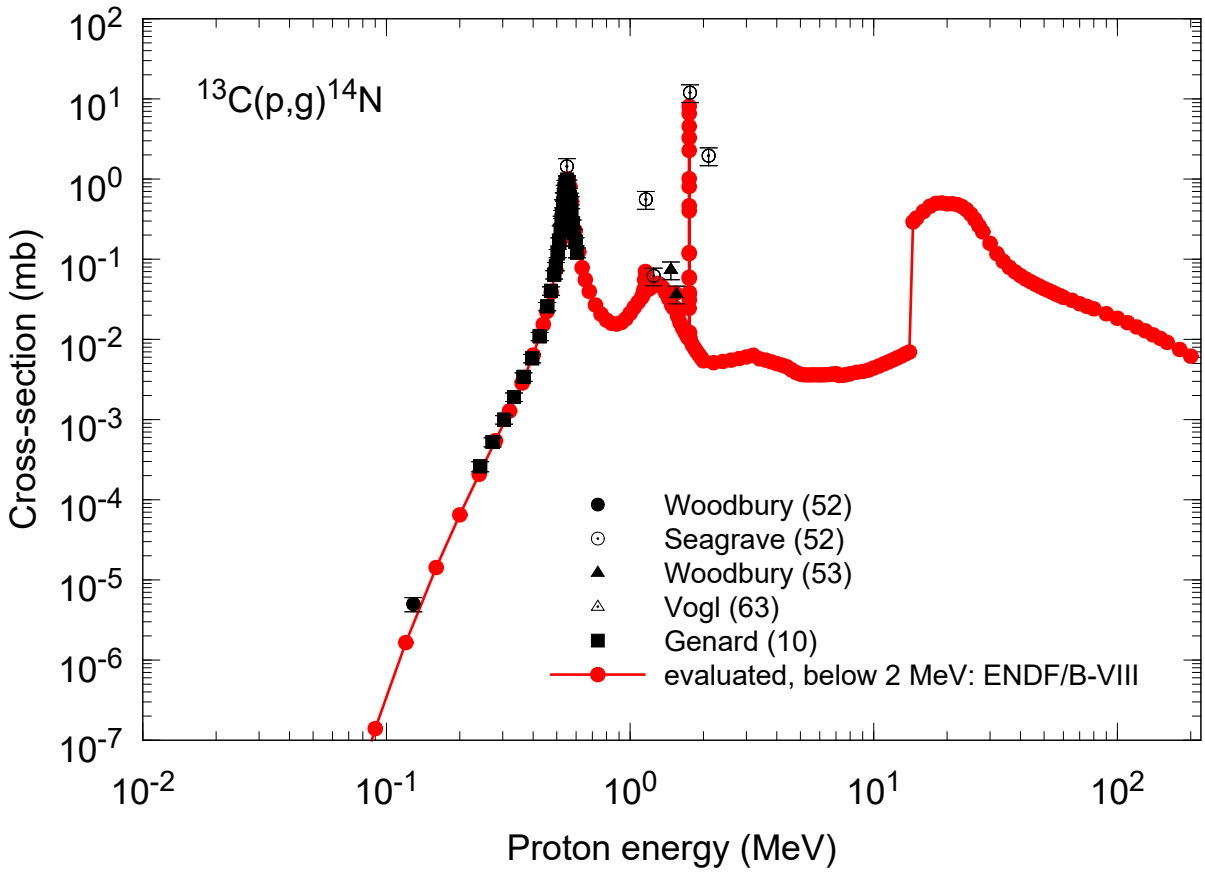

$^{13}C(p,x)^{14}C$
Marrs (79)
Marrs (79)
evaluated
Cross-section (mb)
Proton energy (MeV)
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
130
140
150
160
170
180
190
200

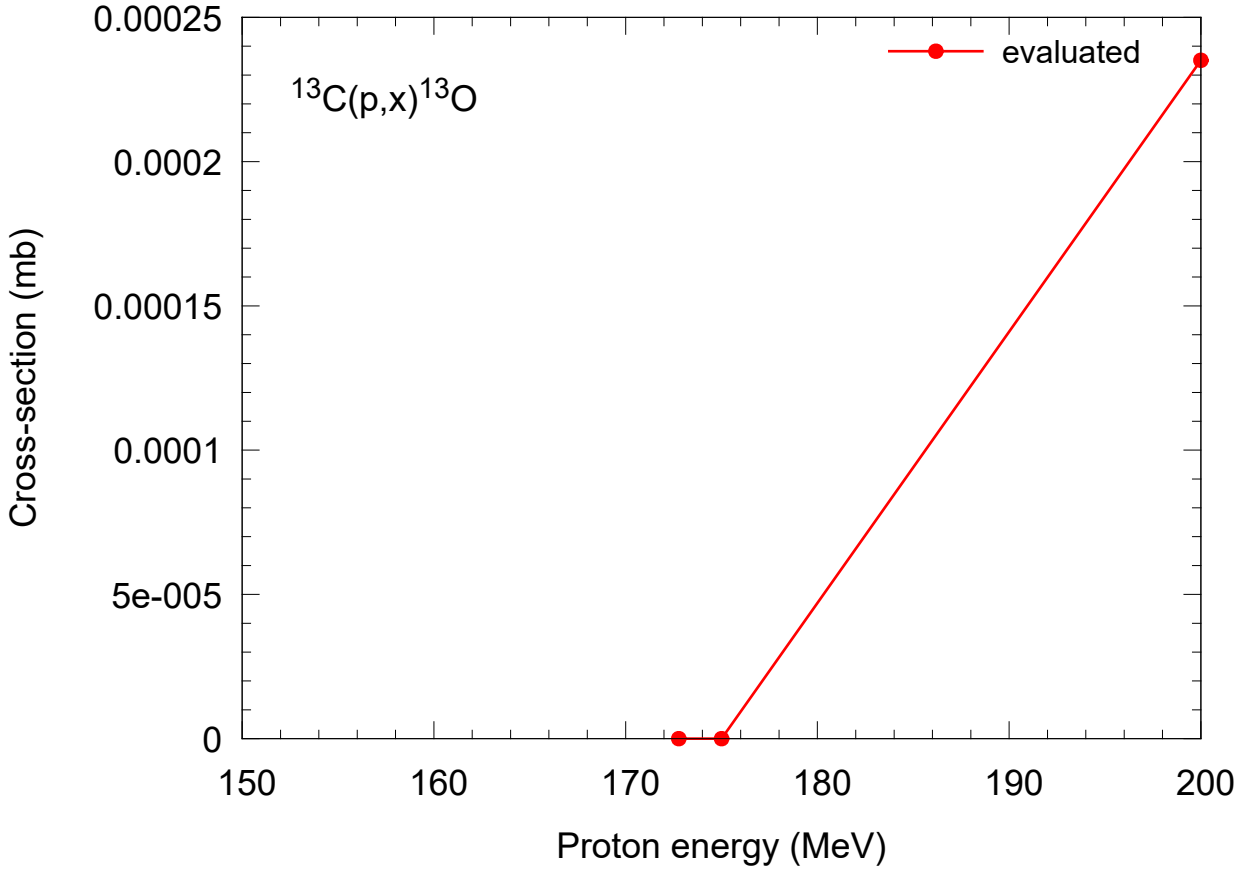

$^{13}C(p,4n)^{10}N$
evaluated
Cross-section (mb)
Proton energy (MeV)
10^{-3}
10^{-4}
10^{-5}
10^{-6}
60
80
100
120
140
160
180
200

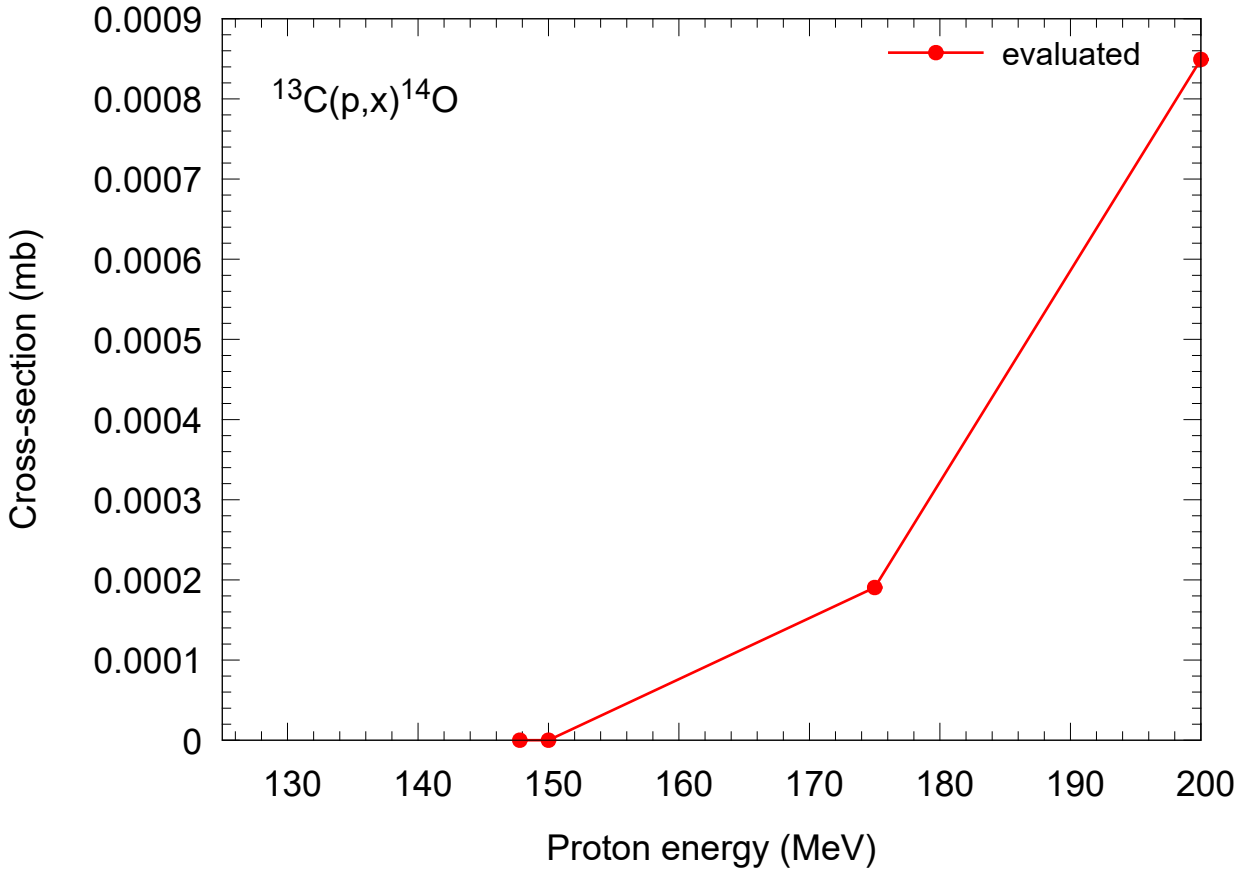

$^{13}C(p,3n)^{11}N$
Cross-section (mb)
10^{-2}
10^{-3}
10^{-4}
0
20
40
60
80
100
120
140
160
180
200
Proton energy (MeV)
evaluated


$^{13}C(p,2n)^{12}N$
Cross-section (mb)
10^{0}
10^{-1}
10^{-2}
10^{-3}
0
20
40
60
80
100
120
140
160
180
200
Proton energy (MeV)
evaluated


$^{13}C(p,n)^{13}N$
Cross-section (mb)
Proton energy (MeV)
Blaser (51)
Gibbons (59)
Wong (61)
Valentin (65)
Lind (75)
Ramstroem (79)
Kitwanga (89)
Firouzbakht (91)
evaluated


$^{13}C(p,g)^{14}N$
Cross-section (mb)
Proton energy (MeV)
Woodbury (52)
Seagrave (52)
Woodbury (53)
Vogl (63)
Genard (10)
evaluated, below 2 MeV: ENDF/B-VIII


0.00025
0.0002
0.00015
0.0001
5e-005
0
Cross-section (mb)
150
160
170
180
190
200
Proton energy (MeV)
evaluated
$^{13}C(p,x)^{13}O$


0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
Cross-section (mb)
130
140
150
160
170
180
190
200
Proton energy (MeV)
evaluated
$^{13}C(p,x)^{14}O$