

PDF Quiz 3: Nuclear Reactions
RDCH 702
Assigned 12-Sep-18, Due 24-Sep-18

Last Name: _____
First Name: _____

The following web pages may be useful:
<http://www.nndc.bnl.gov/qcalc/> <http://nrv.jinr.ru/nrv/webnrv/qcalc/>

1. What is the main factor between center of mass and laboratory frame calculations?

2. What is the equation that relates center of mass and laboratory frame?

$T_{lab} = T_{cm} \left(\frac{m_p}{m_p + m_T} \right)$ $T_{cm} = T_{lab} \left(\frac{m_p}{m_p + m_T} \right)$ $T_{cm} = T_{lab} \left(\frac{m_p}{m_p - m_T} \right)$

3. What is the unit for a barn? _____

4. What is the cross section range for (γ, n) , (γ, p) , and (γ, α) reactions? _____

5. Provide the Q value, threshold energy, and Coulomb barrier for the compound nucleus reaction of ^{18}O with ^{248}Cm .

5.1. What is the product compound nucleus? _____

5.2. Q value _____ MeV

5.3. Threshold energy _____ MeV

5.4. Coulomb Barrier _____ MeV

6. What is the heaviest element that can be formed by fusion in stellar nucleosynthesis? _____

7. Provide the Q value for turning ^{208}Pb into stable Au with an ^{16}O projectile. _____ MeV

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