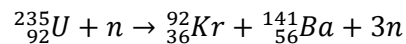# *Energy*

1. What is the difference between an open and a closed question?
2. What is energy?
3. Name 6 different types of energy.
4. What is the difference between renewable and non-renewable energy sources and name 3 of each.
5. What is the difference between nuclear fusion and fission?
6. What does Einstein's famous formula E=mc² tell us about the nature of mass?
7. What year was Helium discovered and where was it first discovered?
8. What is the temperature needed for fusion in the laboratory? What is the temperature in the Sun? Why are they different?
9. What does the abbreviation „ITER" stand for? What goes on there?
10. List five ways that you can save energy in everyday life.

Prob 1. What is the energy produced in the following fission reaction:

$$^{235}_{92}U + n \rightarrow ^{92}_{36}Kr + ^{141}_{56}Ba + 3n$$

M($^{236}_{92}U$) = 235.0439299 u ; M($^{92}_{36}Kr$) = 91.926156 u ; M($^{141}_{56}Ba$) = 140.914411 u,
M(neutron) = 1.008665 u

Prob 2. What is the energy produced in the following fusion reaction:

$$^{3}_{2}He + ^{6}_{3}Li \rightarrow 2^{4}_{2}He + p$$
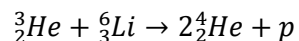
M($^{3}_{2}He$) = 3.0160293 u ; M($^{4}_{2}He$) = 4.002602 u ; M($^{6}_{3}Li$) = 6.015123 u ; M(proton) = 1.007276 u

$$(\; 1 \, u = 1.66 \cdot 10^{-27} kg \qquad \text{speed of light in vacuum} = 3 \cdot 10^{8} \tfrac{m}{s} \;)$$