Radioisotope and Radiation Applications
EXERCISES
Week 1a

Problem 1:
Complete the following reactions:

- Neutron stripping reaction induced by a deuteron beam impinging on a ^{12}C-target.
- Neutron pickup reaction from an ^{3}He-projectile hitting a ^{17}O-nucleus.
- Proton induced charge exchange reaction on a ^{63}Cu-target.

Which particles are transferred in the following reactions:

- (d,^{3}He), (^{3}He,d)
- (d,t), (t,α), (p,α), (d,α)

Problem 2:
Look up decay information for ^{64}Cu. Use various sources.

Problem 3:
What can happen after a (thermal) neutron hits a ^{10}B nucleus?

Problem 4:
Calculate the binding energy of cobalt (100% ^{59}Co) in MJ/kg.
(For ^{59}Co, Z=27, A=59, m=58.91810 amu;
proton, neutron masses: 1.00728, 1.00866 amu.)

Problem 5:
Calculate the energy of the reaction ^{59}Co(p,n)^{59}Ni.
(For ^{59}Ni, Z=28, A=59, m=58.91870 amu.)

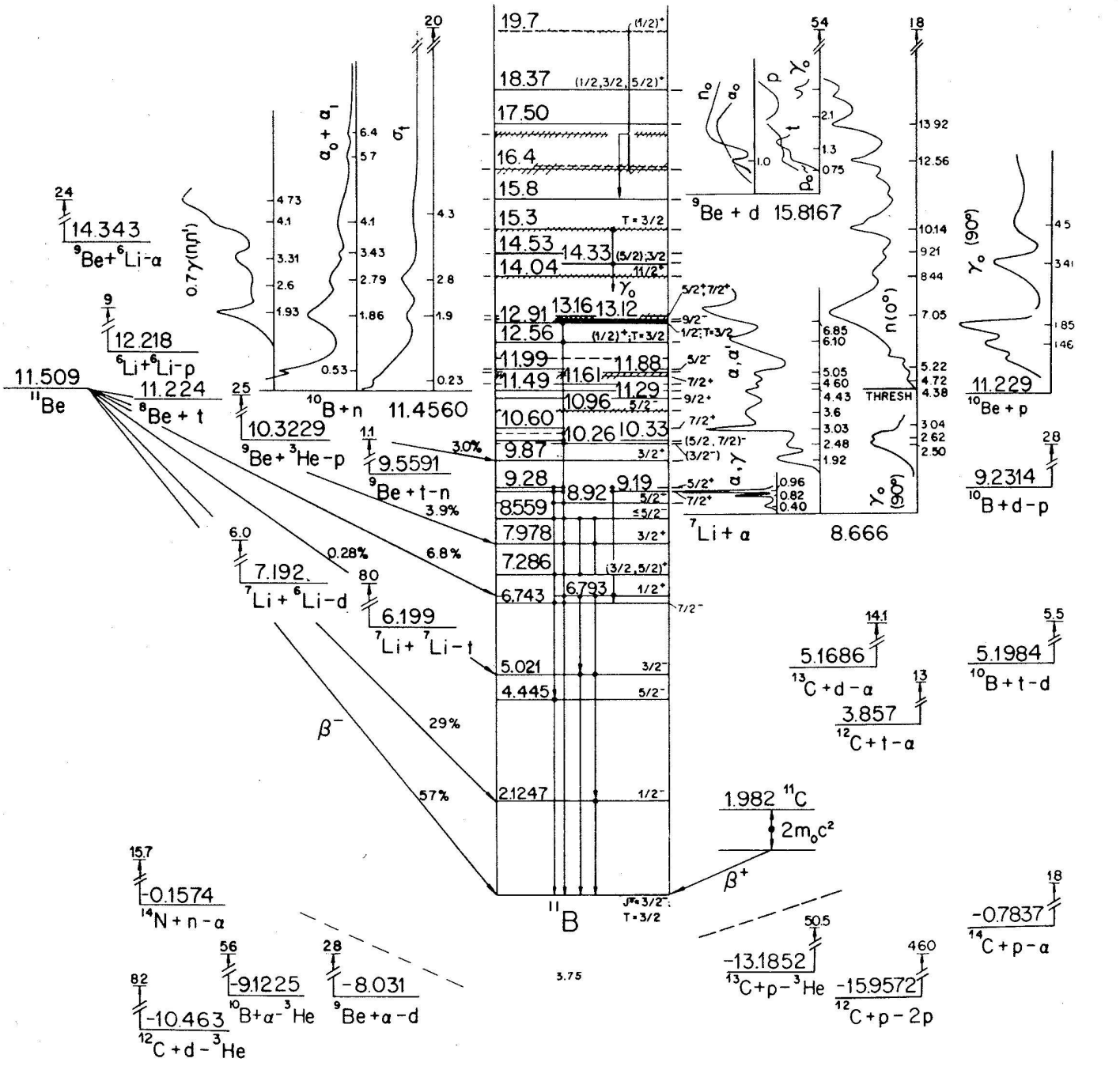

Figure 1: Level scheme of ^{11}B.