Chem 1062

Note Title 8/5/2008

Final Grades

* should be available sometime Friday
* lowest exam, lab, two HW quizzes dropped
* not negotiable

Lab Projects

* presented in S235
* 1st 30 minutes of lab time devoted to final preparations – presentations begin @ 10:50

Final Exam

* nonprogrammable calculators must be used
* review sheet
* 70 questions, 110 minutes (8:00 - 9:50) - so don't be late
* ACS Standardized Exam

D2L Quizzes

* Chapter 19 - error in coding on 19.56 - full value awarded to everyone

$$^{87}_{37}Rb \rightarrow {}^{87}_{38}Sr + {}^{0}_{-1}e$$

$^{1}_{0}n$

$^{4}_{2}He$ $^{0}_{1}e$

$^{1}_{1}H$ $^{0}_{0}\gamma$

Nucleus contains p^+ & n^0

Nuclear forces that hold particles together in the nucleus

Nuclear Shell Model - p^+ and n^0 exist in levels similar to those found for the electrons

Nuclei with even numbers of p^+ or n^0 tend to be more stable

Nuclei with certain numbers of p^+ or n^0 tend to be <u>very</u> stable

* called <u>magic numbers</u> = 2, 8, 20, 28, 50, 82

for p^+, there is one add'l magic number = 114

for n^0, " " " " = 126

" "

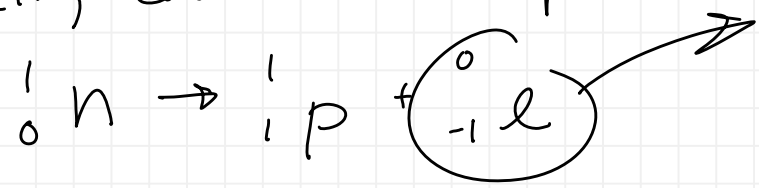
Types of Radioactive Decay

1) Alpha Emission => alpha particles are the same as ^4_2He

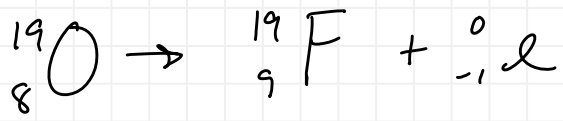
Example: U-238

$$^{238}_{92}U \rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$$

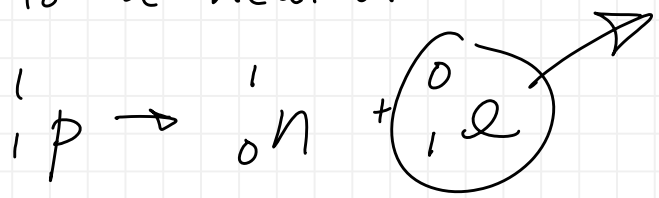
2) Beta emission ⇒ beta particles = electrons
equivalent to a neutron in the nucleus being converted to a proton



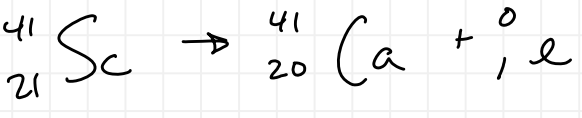
Example: O-19



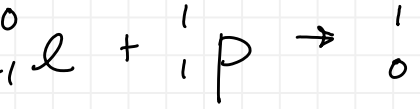
3) Positron emission -
equivalent to a proton being converted to a neutron



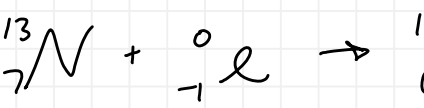
Example: Sc-41



4) Electron Capture (EC) - decay caused by the capture of an inner level electron by nucleus



Example: N-13



5) Gamma emission - emission of very high energy electromagnetic radiation from an excited nucleus (more energetic than X-rays)

Example: Tc-99 (metastable form)

$$^{99m}_{43}Tc \rightarrow ^{99}_{43}Tc + ^{0}_{0}\gamma$$

6) Spontaneous Fission - nuclei spontaneously disintegrate to yield smaller nuclei

Example: U-236

$$^{236}_{92}U \rightarrow ^{94}_{39}Y + ^{136}_{53}I + 4\,^{1}_{0}n$$

232

92

Nuclear Bombardment Reactions