

**Nuclear Physics - Last Problem Set 10 – Due TUESDAY 12/11**

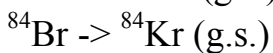
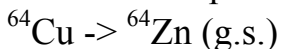
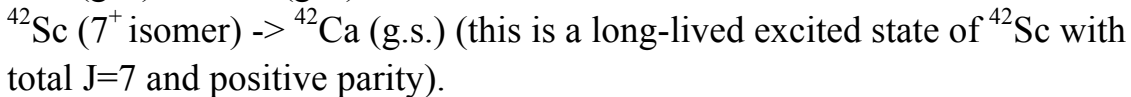
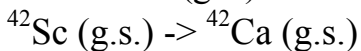
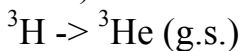
Please send your solution by email, or bring to my office before EOB on that Tuesday. Also, your participation project is DUE BY THURSDAY, 12/6

**Problem 1)**

How many mutually independent constants of nature are required to fully specify the electroweak interaction? List all couplings, masses and mixing angles but avoid double counting (e.g.  $g$ ,  $g'$  and  $e$ ).

**Problem 2)**

Classify the following weak transitions according to their “degree of forbiddenness” (allowed, superallowed, once forbidden, etc.) and to whether they are pure Fermi, pure Gamov-Teller, or mixed (see Chapter 18.6 in Povh et al.):



**Problem 3)**

Calculate the predicted life time  $\tau$  for Tritium ( ${}^3\text{H}$ ) and compare to experiment. (Use equations 16.55 through 16.60 in Povh et al. Why are they applicable here?).

NOTE: This problem requires some work – see me (early!) if you need help.