

Use your Periodic Table and calculator to answer questions on this quiz.

1. A typical atom contains which of these items?

- electrons     elements     gammas     ions     isotopes     molecules  
 neutrons     photons     pions     positrons     protons     solutes

What is the electric charge for a  ${}^{34}_{16}\text{S}$  atom? 0 List how many of what items this atom has.

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(+)16 protons (-)16 electrons = 0  
 18 neutrons

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This atom has how many of each of these? 1s 2 2s 2 2p 6 3s 2 3p 4

Which of those items are responsible for almost all of an atom's mass?

protons & neutrons

Where is most of an atom's mass? { uniformly spread | outer shell | inner shell | center }

Which of those items are responsible for almost all of an atom's volume?

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electrons

Which of those items give off light from the Sulfur atoms? { outer shell | inner shell | center }

What do neutrons do? { help fill atom volume | keep protons apart | keep electrons from protons }

2. Which is the most-common sulfur isotope?

- {  ${}^{32}_{16}\text{S}$  |  ${}^{34}_{16}\text{S}$  |  ${}^{36}_{16}\text{S}$  |  ${}^{38}_{16}\text{S}$  |  ${}^{40}_{16}\text{S}$  |  ${}^{42}_{16}\text{S}$  |  ${}^{44}_{16}\text{S}$  |  ${}^{46}_{16}\text{S}$  |  ${}^{48}_{16}\text{S}$  |  ${}^{50}_{16}\text{S}$  |  ${}^{52}_{16}\text{S}$  |  ${}^{54}_{16}\text{S}$  |  ${}^{56}_{16}\text{S}$  |  ${}^{58}_{16}\text{S}$  |  ${}^{60}_{16}\text{S}$  }

6

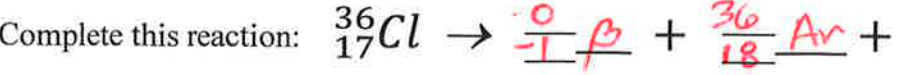
It has (how many) 16 protons, and 16 neutrons, and 16 electrons.

What percentage of sulfur atoms will be the rare isotope?

- { .025% | .035% | .07% | .35% | .7% | 1.25% | 2.5% | 3.5% | 7% | 5% | 14% | 16% | 32% }

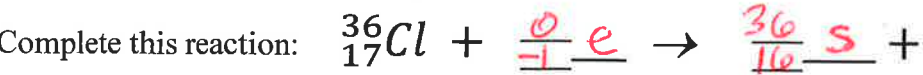
$\frac{.07 \text{ excess amu avg}}{2 \text{ extra neutrons}} = 3\frac{1}{2}\%$     [2] [1]

3. One unstable chlorine isotope, with 301 kilo-year half-life, usually emits an electron.



About 2% of the time, that isotope will capture an atomic electron.

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If a salt deposit had 1000 of these isotopes, 903,000 years ago, about how many would be left now?

(show steps!)

t=0 301kyr 602kyr 903kyr  
 N=1000 500 250 125

$$\frac{12.7 \pm 4.6}{31} \xrightarrow{11 \times .3} \frac{6.8 \pm 1.9}{10}$$