

AP WORKSHEET 01B: ANSWERS

1.

(a) Atoms of the same element with different numbers of neutrons

(b)

1	$^{13}\text{C}_6$	<b>6</b>	<b>6</b>	<b>7</b>	<b>13</b>
2	$^{35}\text{Cl}_{17}$	17	<b>17</b>	18	<b>35</b>
3	$^{56}\text{Fe}_{26}$	<b>26</b>	26	<b>30</b>	56
4	$^{37}\text{Cl}_{17}$	<b>17</b>	17	<b>20</b>	37
5	$^3\text{H}_1$	<b>1</b>	<b>1</b>	2	3
6	$^{128}\text{Te}_{52}$	52	<b>52</b>	<b>76</b>	128
7	$^{120}\text{Sn}_{50}$	<b>50</b>	50	70	<b>120</b>

(c) Same element, same number of protons, same atomic number

(d) Different number of neutrons and different mass number

(e) 58.74

2.

(a) 35.45

(b) 70, 72 and 74

(c) 70, since this molecule will be comprised of the most abundant isotopes

3. Average mass, 79.98

Abundances, 51.1% and 48.9%

$$[(.2569)(158)] + [(0.4999)(160)] + [(0.2431)(162)] = \text{average mass of Br}_2 = 159.9564$$

$$\text{Average mass of Br} = 159.9564/2 = 79.9782$$

$$79.9782 = [x(79) + (100-x)(81)]/100$$

$$x = 51.1$$

4.

- (a) x-axis labeled as m/z  
y-axis labeled as relative abundance or %

Four peaks labeled 50, 52, 53 and 54 respectively, with appropriate, approximate (this is a sketch not a plot) relative heights

- (b) 52.06, chromium

5.

- (a) It has only one, stable isotope  
(b) Aluminum

6.

- (a) Copper 63 = 69.17%; Copper 65 = 30.83%

$$[(X)(62.9296)] + [(100 - X)(64.9278)] / 100 = \text{average mass of Cu} = 63.5456$$

$$X = 69.17$$

- (b) x-axis labeled as m/z  
y-axis labeled as relative abundance or %

Two peaks labeled 63 and 65 respectively, with appropriate, approximate (this is a sketch not a plot) relative heights