Key Stoich

① $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$

2.9 mol Cu

B	?	2.9	5.8	
C	$-X$	$-2X$ (2.9)	$+X$	$+2X$
A	○	○		

② $C_2H_6O + 3O_2 \rightarrow 2CO_2 + 3H_2O$

?L

B	5.420		○	○
C	$-X$	$-3X$	$+2X$ (5.420)	$+3X$
A	○			

$$10.840\ mol \left| \frac{22.4\ L\ CO_2}{1\ mol} \right. = 242.82\ L\ CO_2$$

③ $2H_2 + O_2 \rightarrow 2H_2O$

B		2500	○
C	$-2X$	$-X$	$+2X$ (2.500)
A		○	

$$5\ mol\ H_2O \left| \frac{18\ g\ H_2O}{1\ mol} \right. = 90\ g\ H_2O$$

④ $2Zn + O_2 \rightarrow 2ZnO$

B		? 2.20	○
C	$-2X$	$-X$ (2.20)	$+2X = 4.41$
A			

$$2.20\ mol \left| \frac{32\ g\ O_2}{1\ mol\ O_2} \right. = 70.4\ g\ O_2$$

$$358.5\ g\ ZnO \left| \frac{1\ mol}{81.38\ g\ ZnO} \right. = 4.41\ mol$$

⑤ $2Al + 3H_2SO_4 \Rightarrow Al_2(SO_4)_3 + 3H_2$

B	5.56	?	8.34	
C	$-2X$	$-3X$	$+X$	$+3X$
A		$X = 2.78$	3(2.78)	

$$150\ g\ Al \left| \frac{1\ mol\ Al}{26.98\ g\ Al} \right. = 5.56\ mol$$

$$8.34\ mol\ H_2SO_4 \left| \frac{98.09\ g}{1\ mol} \right. = 817.90\ g\ H_2SO_4$$

⑥ $2H_2 + O_2 \rightarrow 2H_2O$

3.6L L?

B	0.161	.081	0
C	-2X	-X(.081)	+2X
A			

$3.6\text{L } H_2 \left| \frac{1\text{ mol}}{22.4\text{L}} \right. = 0.161$

$X = \frac{.161}{2} = .081\text{ mol} \left| \frac{22.4\text{L } O_2}{1\text{ mol}} \right. = \boxed{1.8\text{ L } O_2}$

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⑦ $2P + 3H_2 \rightarrow 2PH_3$

6.2g 4.0g

B	.200	2 mol	0
C	-2X(.1)	-3X(.1)	+2X(.1)
A	0	XS	?

$6.2\text{g P} \left| \frac{1\text{ mol}}{30.97\text{g P}} \right. = .200\text{ mol P}$

$4\text{g } H_2 \left| \frac{1\text{ mol}}{2\text{g } H_2} \right. = 2\text{ mol } H_2$

$.2\text{ mol } PH_3 \left| \frac{33.97\text{g } PH_3}{1\text{ mol}} \right. = \boxed{6.79\text{g } PH_3}$

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⑧ $2AlCl_3 + 3Br_2 \rightarrow 2AlBr_3 + 3Cl_2$

84.2g 68.4g

B	.632	.428	~~0~~	0
C	-2X	-3X	~~+2X~~	+3X(.143)
A	XS	.143		.429

$84.2\text{g } AlCl_3 \left| \frac{1\text{ mol}}{133.33\text{g } AlCl_3} \right. = .632$

$68.4\text{g } Br_2 \left| \frac{1\text{ mol}}{159.8\text{g } Br_2} \right. = .428$

$.429\text{ mol } Cl_2 \left| \frac{70.9\text{g } Cl_2}{1\text{ mol } Cl_2} \right. = \boxed{30.42\text{g } Cl_2}$

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⑨