ATOMIC STRUCTURE (D)

1 Complete the table about these atoms and ions.

atom / ion	protons	neutrons	electrons	electron structure
$^{37}_{17}Cl$	**17**	**20**	**17**	**2,8,7**
$^{37}_{17}Cl^{-}$	**17**	**20**	**18**	**2,8,8**
$^{26}_{12}Mg$	**12**	**14**	**12**	**2,8,2**
$^{26}_{12}Mg^{2+}$	**12**	**14**	**10**	**2,8**

2 Complete the table to show what happens when these elements react together, or whether no reaction occurs.

elements	what happens			type of bonding (if reaction occurs)		type of compound (if reaction occurs)	
	no reaction	electrons shared	electrons transferred	covalent	ionic	molecular	ionic
sodium + iron	✓						
bromine + sulfur		✓		✓		✓	
iodine + zinc			✓		✓		✓
argon + magnesium	✓						

3 Calcium atoms react with oxygen atoms in the ratio 1:1 to form calcium oxide.

a Give the electron structure of these atoms and ions.

$^{40}_{20}Ca$ **2,8,8,2** $^{40}_{20}Ca^{2+}$ **2,8,8** $^{16}_{8}O$ **2,6** $^{16}_{8}O^{2-}$ **2,8**

b Explain why calcium atoms react with oxygen atoms.

calcium atoms lose electrons to achieve a stable electron structure
oxygen atoms gain electrons to achieve a stable electron structure
therefore electrons are transferred from calcium atoms to oxygen atoms

c Explain why calcium atoms react with oxygen atoms in the ratio 1:1.

each calcium atom loses 2 electrons
each oxygen atoms gains 2 electrons