Worksheet 7.3

Naming compounds and balancing redox equations

1 Name the following compounds.

a GeO_2
b Cu_2O
c $CaSO_3$
d KIO_3
e $NaNO_2$
f MnO_4^{2-}
g VO_2^{+}
h $SnBr_4$
i K_2CrO_4
j $Mg(ClO_4)_2.6H_2O$ [10]

2 Write the formulae for the following compounds.

a copper(I) chloride
b iron(III) nitrate(V)
c barium nitrate(III) (also called barium nitrite)
d tin(IV)sulfate(VI)
e phosphorus(V) sulfide
f sodium chlorate(V)
g magnesium nitride
h chromium(III) sulfate-18-water (S in sulfate has oxidation number +6) [8]

3 Write two half-equations for each of the following reactions.

a $Mg + 2Ag^{+} \rightarrow Mg^{2+} + 2Ag$ [2]
b $2Br^{-} + Cl_2 \rightarrow Br_2 + 2Cl^{-}$ [2]
c $2I^{-} + H_2O_2 + 2H^{+} \rightarrow I_2 + 2H_2O$ [2]
d $3Cu + 8H^{+} + 2NO_3^{-} \rightarrow 3Cu^{2+} + 2NO + 4H_2O$ [2]
e $Cr_2O_7^{2-} + 6I^{-} + 14H^{+} \rightarrow 2Cr^{3+} + I_2 + 7H_2O$ [2]

4 Use the oxidation number method to balance the following equations. Show all oxidation numbers and all oxidation number changes.

a $Co^{2+} + Cl_2 \rightarrow Co^{3+} + Cl^{-}$ [5]
b $Fe^{3+} + Zn \rightarrow Zn^{2+} + Fe^{2+}$ [5]
c $Al + H^{+} \rightarrow Al^{3+} + H_2$ [5]
d $MnO_4^{-} + SO_3^{2-} + H^{+} \rightarrow Mn^{2+} + SO_4^{2-} + H_2O$ [6]
e $AsO_3^{3-} + Zn + H^{+} \rightarrow AsH_3 + Zn^{2+} + H_2$ [6]
f $I_2 + OH^{-} \rightarrow I^{-} + IO_3^{-} + H_2O$ [6]

Hint: In part **f** some of the iodine is oxidised to IO_3^{-} ions and some is reduced to I^{-} ions. You balance the oxidation numbers by considering the ratio of these two ions. A reaction in which a substance oxidises and reduces itself is called a **disproportionation reaction** (see page **186** of the Coursebook).

