Oxidation Numbers

Determine the oxidation number of the underlined element. (Answers on back.)

1) $\underline{N}H_4^+$

2) $\underline{Mn}O_2$

3) $(NH_4)_2\underline{S}O_3$

4) $H\underline{P}O_4^{2-}$

5) $H_3\underline{P}O_4$

6) $NH_4\underline{Br}O$

7) $\underline{S}O_3^{2-}$

8) $NaH\underline{S}O_4$

9) $\underline{Co}_3(PO_4)_2$

10) $\underline{Mn}O_4^-$

11) $\underline{P}O_3^{3-}$

12) $\underline{Cl}O_4^-$

13) $\underline{Cl}O_3^-$

14) $\underline{Cl}O_2^-$

15) $\underline{Cl}O^-$

16) $\underline{Cl}_2O$

17) $\underline{S}O_4^{2-}$

18) $\underline{S}F_4$

19) $\underline{S}_2O_3^{2-}$

20) $\underline{C}_2H_3O_2^-$

21) $\underline{C}O_3^{2-}$

22) $\underline{C}H_4$

1) $\underline{N}H_4^+$

$X_N + 4(+1) = +1$
$X_N = -3$

2) $\underline{Mn}O_2$

$X_{Mn} + 2(-2) = 0$
$X_{Mn} = +4$

3) $(NH_4)_2\underline{S}O_3$ (treat NH_4^+ as a unit)

$2(+1) + X_S + 3(-2) = 0$
$X_S = +4$

4) $H\underline{P}O_4^{2-}$

$1(+1) + X_P + 4(-2) = -2$
$X_P = +5$

5) $H_3\underline{P}O_4$

$3(+1) + X_P + 4(-2) = 0$
$X_P = +5$

6) $NH_4\underline{Br}O$ (treat NH_4^+ as a unit)

$1(+1) + X_{Br} + 1(-2) = 0$
$X_{Br} = +1$

7) $\underline{S}O_3^{2-}$

$X_S + 3(-2) = -2$
$X_S = +4$

8) $NaH\underline{S}O_4$

$1(+1) + 1(+1) + X_S + 4(-2) = 0$
$X_S = +6$

9) $\underline{Co}_3(PO_4)_2$ (treat PO_4^{3-} as a unit)

$3X_{Co} + 2(-3) = 0$
$3X_{Co} = +6$; $X_{Co} = +2$

10) $\underline{Mn}O_4^-$

$X_{Mn} + 4(-2) = -1$
$X_{Mn} = +7$

11) $\underline{P}O_3^{3-}$

$X_P + 3(-2) = -3$
$X_P = +3$

12) $\underline{Cl}O_4^-$

$X_{Cl} + 4(-2) = -1$
$X_{Cl} = +7$

13) $\underline{Cl}O_3^-$

$X_{Cl} + 3(-2) = -1$
$X_{Cl} = +5$

14) $\underline{Cl}O_2^-$

$X_{Cl} + 2(-2) = -1$
$X_{Cl} = +3$

15) $\underline{Cl}O^-$

$X_{Cl} + 1(-2) = -1$
$X_{Cl} = +1$

16) $\underline{Cl}_2O$

$2X_{Cl} + 1(-2) = 0$
$2X_{Cl} = +2$; $X_{Cl} = +1$

17) $\underline{S}O_4^{2-}$

$X_S + 4(-2) = -2$
$X_S = +6$

18) $\underline{S}F_4$

$X_S + 4(-1) = 0$
$X_S = +4$

19) $\underline{S}_2O_3^{2-}$

$2X_S + 3(-2) = -2$
$2X_S = +4$; $X_S = +2$

20) $\underline{C}_2H_3O_2^-$

$2X_C + 3(+1) + 2(-2) = -1$
$2X_C = 0$; $X_C = 0$

21) $\underline{C}O_3^{2-}$

$X_C + 3(-2) = -2$
$X_C = +4$

22) $\underline{C}H_4$

$X_C + 4(+1) = 0$
$X_C = -4$