

1

Assegna il numero di ossidazione a tutti gli elementi dei seguenti composti.

- $\text{Hg}_3(\text{PO}_3)_2$
- $\text{Cu}(\text{NO}_2)_2$
- $\text{Pb}(\text{SO}_3)_2$
- $\text{HClO}_2$
- $\text{Na}_2\text{O}_2$
- $\text{LiH}$

Hg: +2; P: +3; O: -2  
 Cu: +2; N: +3; O: -2  
 Pb: +4; S: +4; O: -2  
 H: +1; Cl: +3; O: -2  
 Na: +1; O: -1  
 Li: +1; H: -1

2

Trova i numeri di ossidazione degli atomi in neretto nei seguenti composti.

**$\text{VO}^+$**  (+5),  **$\text{MnO}^+$**  (+7),  **$\text{WO}^+$**  (+7),  $\text{H}_3\text{BO}_3$  (+3),  $\text{P}_2\text{O}_5$  (+5),  $\text{HClO}_2$  (+3),  $\text{KIO}_4$  (+7),  $\text{HSO}_3^-$  (+4),  **$\text{HS}$**  (-2),  **$\text{Ag}_2\text{O}$**  (+1),  **$\text{SnO}_2$**  (+4),  **$\text{HCrO}_4^-$**  (+6),  **$\text{PH}_3$**  (-3)

3

Calcola il numero di ossidazione di tutti gli elementi nelle seguenti molecole.

- $\text{H}_2\text{SO}_4$
- $\text{CaHPO}_4$
- $\text{Fe}(\text{OH})_3$
- $\text{NaH}$
- $\text{Mg}(\text{H}_2\text{PO}_4)_2$

H: +1; S: +6; O: -2  
 Ca: +2; H: +1; P: +5; O: -2  
 Fe: +3; O: -2; H: +1  
 Na: +1; H: -1  
 Mg: +2; H: +1; P: +5; O: -2

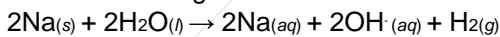
4

Lo ione  $\text{CrO}_4^{2-}$  è coinvolto in una reazione chimica, nel corso della quale si trasforma in ione  $\text{Cr}^{3+}$ . Come varia il numero di ossidazione dell'atomo di cromo?

da +6 a +3

5

Considera la seguente reazione:



- Qual è l'elemento che si è ossidato?
- Qual è l'elemento che si è ridotto?

Il sodio si è ossidato e l'idrogeno si è ridotto.

6

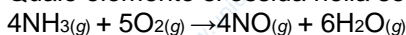
Quali tra le seguenti sono reazioni di ossido-riduzione?

- $2\text{CrO}_4^{2-}(aq) + 2\text{H}^+(aq) \rightarrow \text{Cr}_2\text{O}_7^{2-}(aq) + \text{H}_2\text{O}(l)$
- $\text{Fe}_2\text{O}_3(s) + 2\text{Al}(s) \rightarrow \text{Al}_2\text{O}_3(s) + 2\text{Fe}(s)$
- $\text{Cu}^{2+}(aq) + 4\text{NH}_3(aq) \rightarrow [\text{Cu}(\text{NH}_3)_4]^{2+}(aq)$
- $\text{CuSO}_4(aq) + \text{BaCl}_2(aq) \rightarrow \text{CuCl}_2(aq) + \text{BaSO}_4(s)$
- $4\text{HF}(l) + \text{SiO}_2(s) \rightarrow \text{SiF}_4(g) + 2\text{H}_2\text{O}(s)$

x

7

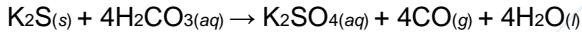
Quale elemento si ossida nella seguente reazione?



N

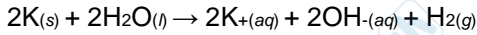
8

Quale elemento si riduce nella seguente reazione?

C: da +4 (H<sub>2</sub>CO<sub>3</sub>) a +2 (CO)

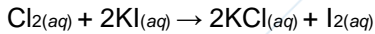
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Quale elemento si è ossidato nella seguente reazione?

K: da 0 (K) a +1 (K<sup>+</sup>)

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È data la seguente reazione:

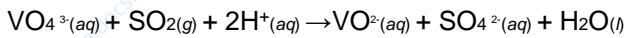


Qual è l'agente ossidante?

Cl<sub>2</sub>

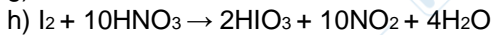
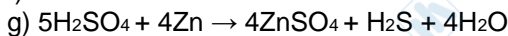
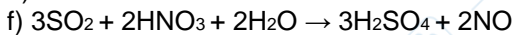
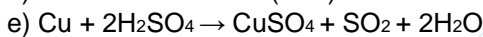
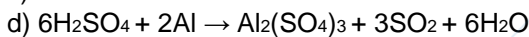
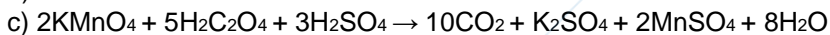
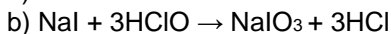
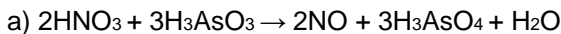
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Individua l'agente ossidante nella seguente reazione redox ancora da bilanciare.

VO<sub>4</sub><sup>3-</sup>

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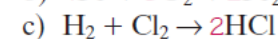
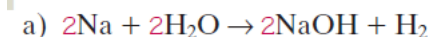
Identifica l'elemento che si ossida, quello che si riduce, l'agente ossidante e il riducente nelle seguenti reazioni.



	Elemento che si ossida	Riducente	Elemento che si riduce	Ossidante
a	As	H <sub>3</sub> AsO <sub>3</sub>	N	HNO <sub>3</sub>
b	I	NaI	Cl	HClO
c	C	H <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	Mn	KMnO <sub>4</sub>
d	Al	Al	S	H <sub>2</sub> SO <sub>4</sub>
e	Cu	Cu	S	H <sub>2</sub> SO <sub>4</sub>
f	S	SO <sub>2</sub>	N	HNO <sub>3</sub>
g	Zn	Zn	S	H <sub>2</sub> SO <sub>4</sub>
h	I	I <sub>2</sub>	N	HNO <sub>3</sub>

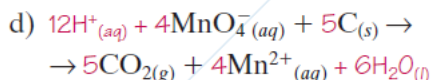
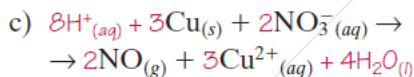
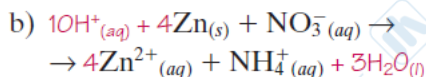
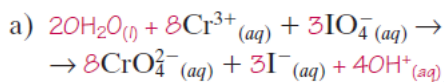
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Bilancia le seguenti reazioni redox.



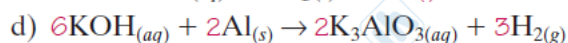
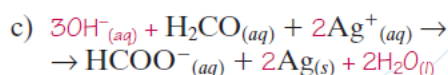
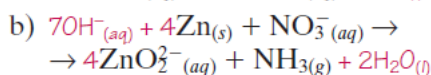
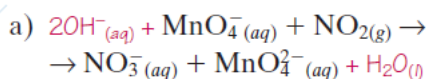
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Bilancia le seguenti reazioni redox in ambiente acido.



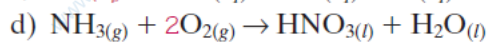
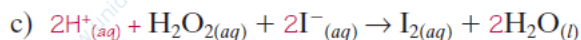
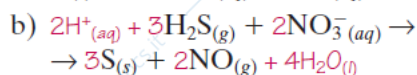
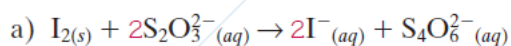
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Bilancia le seguenti reazioni redox in ambiente basico.



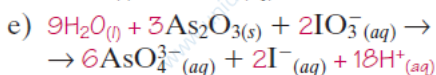
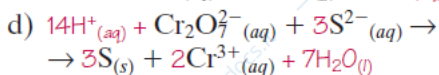
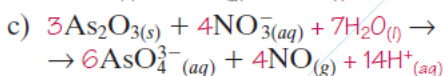
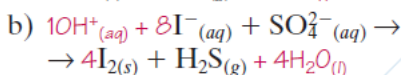
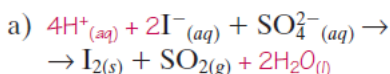
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Bilancia le seguenti reazioni redox in ambiente acido.



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Bilancia le seguenti reazioni redox in ambiente acido.



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Bilancia le seguenti reazioni redox.

- a)  $4\text{NH}_3(g) + 7\text{O}_2(g) \rightarrow 4\text{NO}_2(g) + 6\text{H}_2\text{O}(l)$   
 b)  $\text{Fe}_2\text{O}_3(s) + 3\text{CO}(g) \rightarrow 2\text{Fe}(s) + 3\text{CO}_2(g)$   
 c)  $2\text{H}_2\text{O}(l) + 2\text{K}(s) \rightarrow 2\text{KOH}(aq) + \text{H}_2(g)$

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Bilancia le seguenti reazioni redox che avvengono in ambiente acido.

- a)  $2\text{H}^+ + 2\text{S}_2\text{O}_3^{2-} + \text{ClO}^- \rightarrow \text{Cl}^- + \text{S}_4\text{O}_6^{2-} + \text{H}_2\text{O}$   
 b)  $4\text{H}^+ + 2\text{NO}_3^- + \text{Cu} \rightarrow 2\text{NO}_2 + \text{Cu}^{2+} + 2\text{H}_2\text{O}$   
 c)  $\text{IO}_3^- + 3\text{AsO}_3^{3-} \rightarrow \text{I}^- + 3\text{AsO}_4^{3-}$   
 d)  $4\text{H}^+ + \text{SO}_4^{2-} + \text{Zn} \rightarrow \text{Zn}^{2+} + \text{SO}_2 + 2\text{H}_2\text{O}$   
 e)  $4\text{H}^+ + 2\text{Cr}^{3+} + 3\text{BiO}_3^- \rightarrow \text{Cr}_2\text{O}_7^{2-} + 3\text{Bi}^{3+} + 2\text{H}_2\text{O}$   
 f)  $\text{H}_2\text{O} + \text{I}_2 + 5\text{ClO}^- \rightarrow 2\text{IO}_3^- + 5\text{Cl}^- + 2\text{H}^+$   
 g)  $14\text{H}^+ + 2\text{Mn}^{2+} + 5\text{BiO}_3^- \rightarrow$   
 $\rightarrow 2\text{MnO}_4^- + 5\text{Bi}^{3+} + 7\text{H}_2\text{O}$   
 h)  $8\text{H}^+ + 3\text{H}_3\text{AsO}_3 + \text{Cr}_2\text{O}_7^{2-} \rightarrow$   
 $\rightarrow 3\text{H}_3\text{AsO}_4 + 2\text{Cr}^{3+} + 4\text{H}_2\text{O}$   
 i)  $3\text{H}^+ + 2\text{I}^- + \text{HSO}_4^- \rightarrow \text{I}_2 + \text{SO}_2 + 2\text{H}_2\text{O}$   
 l)  $4\text{H}^+ + 3\text{Sn} + 4\text{NO}_3^- \rightarrow 3\text{SnO}_2 + 4\text{NO} + 2\text{H}_2\text{O}$   
 m)  $4\text{H}^+ + \text{PbO}_2 + 4\text{Cl}^- \rightarrow \text{PbCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$   
 n)  $2\text{H}^+ + \text{Ag} + \text{NO}_3^- \rightarrow \text{NO}_2 + \text{Ag}^+ + \text{H}_2\text{O}$   
 o)  $4\text{Fe}^{3+} + 2\text{NH}_3\text{OH}^+ \rightarrow$   
 $\rightarrow 4\text{Fe}^{2+} + \text{N}_2\text{O} + 6\text{H}^+ + \text{H}_2\text{O}$   
 p)  $2\text{H}^+ + 2\text{HNO}_2 + 2\text{I}^- \rightarrow \text{I}_2 + 2\text{NO} + 2\text{H}_2\text{O}$   
 q)  $2\text{H}^+ + \text{C}_2\text{O}_4^{2-} + 2\text{HNO}_2 \rightarrow 2\text{CO}_2 + 2\text{NO} + 2\text{H}_2\text{O}$   
 r)  $\text{H}^+ + 5\text{HNO}_2 + 2\text{MnO}_4^- \rightarrow$   
 $\rightarrow 2\text{Mn}^{2+} + 5\text{NO}_3^- + 3\text{H}_2\text{O}$   
 s)  $16\text{H}^+ + 3\text{H}_3\text{PO}_2 + 2\text{Cr}_2\text{O}_7^{2-} \rightarrow$   
 $\rightarrow 3\text{H}_3\text{PO}_4 + 4\text{Cr}^{3+} + 8\text{H}_2\text{O}$   
 t)  $4\text{H}^+ + 2\text{VO}_2^+ + \text{Sn}^{2+} \rightarrow 2\text{VO}^{2+} + \text{Sn}^{4+} + 2\text{H}_2\text{O}$   
 u)  $\text{XeF}_2 + 2\text{Cl}^- \rightarrow \text{Xe} + 2\text{F}^- + \text{Cl}_2$

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Bilancia le seguenti reazioni redox che avvengono in ambiente basico.

