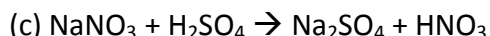
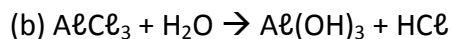
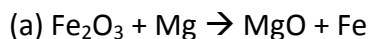


Lista de Exercícios 05 – Reações Químicas

1) Balanceie as seguintes equações químicas:

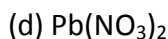
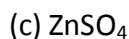


2) Sabemos que certos alimentos que ingerimos contêm ácidos. Justifique a razão pela qual os dentistas usam uma mistura contendo mercúrio e prata nas obturações.

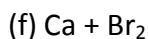
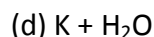
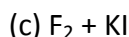
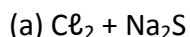
3) Três recipientes contêm uma mesma solução diluída de H_2SO_4 . Em deles é colocado um pedaço de ouro, em outro coloca-se cobre e no terceiro, zinco. Em qual dos casos haverá formação de hidrogênio gasoso? Escreva a equação correspondente.

4) Mergulham-se, separadamente, os metais Ag, Cu, K e Ni em soluções aquosas de ZnCl_2 . Em qual dos casos ocorre reação? Escreva a equação balanceada.

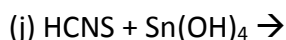
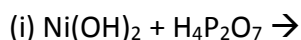
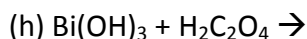
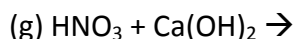
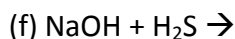
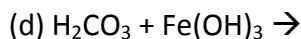
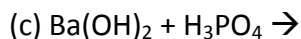
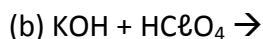
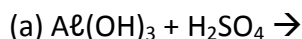
5) Em qual das soluções abaixo se pode mergulhar um prego de ferro de modo a não ocorrer reação? Justifique sua escolha.



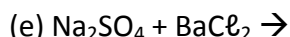
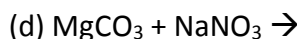
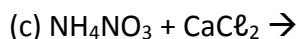
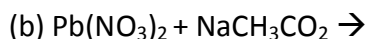
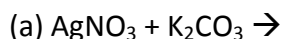
6) Determine os casos em que ocorre uma reação e escreva a equação balanceada.



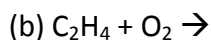
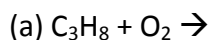
7) Complete e balanceie as reações de neutralização abaixo.



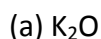
8) Verifique se as reações abaixo ocorrem e monte a equação balanceada quando necessário.



9) Complete e balanceie as reações de combustão abaixo.



10) Escreva as equações dos seguintes óxidos reagindo com a água.



11) Sabendo que Ag_2O e CuO são óxidos básicos, escreva a equação direta entre cada óxido e H_2SO_4 . Para isso, escreva antes as duas etapas da reação desses óxidos com o ácido em solução.

12) Complete as reações abaixo:

- | | | |
|---|---|---|
| (a) $\text{CO}_2 + \text{H}_2\text{O}$ | (b) $\text{SO}_3 + \text{H}_2\text{O}$ | (c) $\text{Cl}_2\text{O}_7 + \text{H}_2\text{O}$ |
| (d) $\text{P}_2\text{O}_3 + 3 \text{H}_2\text{O}$ | (e) $\text{Cl}_2\text{O}_3 + \text{NaOH}$ | (f) $\text{I}_2\text{O}_5 + \text{Mg}(\text{OH})_2$ |

13) O alumínio forma um óxido anfótero, complete as reações abaixo:

- | | |
|--|---|
| (a) $\text{Al}_2\text{O}_3 + \text{HCl}$ | (b) $\text{Al}_2\text{O}_3 + \text{NaOH}$ |
|--|---|

14) Complete as seguintes equações químicas e faça o balanceamento de cada uma delas.

- | | |
|--|---|
| (a) $\text{HNO}_3 + \text{MgCO}_3 \rightarrow$ | (b) $\text{HCl} + \text{NaHCO}_3 \rightarrow$ |
|--|---|

15) Atribua o número de oxidação dos elementos sublinhados nas seguintes substâncias.

- | | | |
|--|---|---|
| (a) $\underline{\text{N}}\text{H}_3$ | (b) $\text{P}\underline{\text{4}}$ | (c) $\text{Na}_3\underline{\text{P}}\text{O}_4$ |
| (d) $\text{Al}(\underline{\text{Cl}}\text{O}_3)_3$ | (e) $\underline{\text{S}}_2\text{O}_3^{2-}$ | (f) $\underline{\text{N}}\text{H}_4^+$ |

16) Balanceie as seguintes reações e identifique o agente oxidante e o redutor.

- (a) $\text{HNO}_3 + \text{SnO} \rightarrow \text{NO} + \text{SnO}_2 + \text{H}_2\text{O}$
(b) $\text{MnO}_2 + \text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$
(c) $\text{H}_2\text{S} + \text{HNO}_3 \rightarrow \text{S} + \text{NO} + \text{H}_2\text{O}$
(d) $\text{CuS} + \text{O}_2 \rightarrow \text{CuO} + \text{SO}_2$
(e) $\text{I}_2\text{O}_5 + \text{CO} \rightarrow \text{I}_2 + \text{CO}_2$
(f) $\text{SnCl}_2 + \text{HgCl}_2 \rightarrow \text{SnCl}_4 + \text{Hg}_2\text{Cl}_2$

Gabarito

1) (a) $\text{Fe}_2\text{O}_3 + 3 \text{Mg} \rightarrow 3 \text{MgO} + \text{Fe}$; (b) $\text{AlCl}_3 + 3 \text{H}_2\text{O} \rightarrow \text{Al}(\text{OH})_3 + 3 \text{HCl}$; (c) $2 \text{NaNO}_3 + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{HNO}_3$; (d) $\text{NiCO}_3 + 2 \text{HNO}_3 \rightarrow \text{Ni}(\text{NO}_3)_2 + \text{CO}_2 + \text{H}_2\text{O}$.

3) $\text{Zn (s)} + \text{H}_2\text{SO}_4 \text{ (aq)} \rightarrow \text{ZnSO}_4 \text{ (aq)} + \text{H}_2 \text{ (g)}$.

4) $2 \text{K (s)} + \text{ZnCl}_2 \text{ (aq)} \rightarrow \text{Zn (s)} + 2 \text{KCl (aq)}$.

5) (c).

6) (a) $\text{Cl}_2 + \text{Na}_2\text{S} \rightarrow 2 \text{NaCl} + \text{S}$; (b) não ocorre; (c) $\text{F}_2 + 2 \text{KI} \rightarrow 2 \text{KF} + \text{I}_2$; (d) $2 \text{K} + 2 \text{H}_2\text{O} \rightarrow 2 \text{KOH} + \text{H}_2$; (e) $2 \text{Li} + \text{S} \rightarrow \text{Li}_2\text{S}$; (f) $\text{Ca} + \text{Br}_2 \rightarrow \text{CaBr}_2$.

7) (a) $2 \text{Al}(\text{OH})_3 + 3 \text{H}_2\text{SO}_4 \rightarrow 6 \text{H}_2\text{O} + \text{Al}_2(\text{SO}_4)_3$; (b) $\text{KOH} + \text{HClO}_4 \rightarrow \text{H}_2\text{O} + \text{KClO}_4$; (c) $3 \text{Ba}(\text{OH})_2 + 2 \text{H}_3\text{PO}_4 \rightarrow 6 \text{H}_2\text{O} + \text{Ba}_3(\text{PO}_4)_2$; (d) $3 \text{H}_2\text{CO}_3 + 2 \text{Fe}(\text{OH})_3 \rightarrow 6 \text{H}_2\text{O} + \text{Fe}_2(\text{CO}_3)_3$; (e) $2 \text{HCN} + \text{Mg}(\text{OH})_2 \rightarrow 2 \text{H}_2\text{O} + \text{Mg}(\text{CN})_2$; (f) $2 \text{NaOH} + \text{H}_2\text{S} \rightarrow 2 \text{H}_2\text{O} + \text{Na}_2\text{S}$; (g) $2 \text{HNO}_3 + \text{Ca}(\text{OH})_2 \rightarrow 2 \text{H}_2\text{O} + \text{Ca}(\text{NO}_3)_2$; (h) $2 \text{Bi}(\text{OH})_3 + 3 \text{H}_2\text{C}_2\text{O}_4 \rightarrow 6 \text{H}_2\text{O} + \text{Bi}_2(\text{C}_2\text{O}_4)_3$; (i) $2 \text{Ni}(\text{OH})_2 + \text{H}_4\text{P}_2\text{O}_7 \rightarrow 4 \text{H}_2\text{O} + \text{Ni}_2\text{P}_2\text{O}_7$; (j) $4 \text{HCNS} + \text{Sn}(\text{OH})_4 \rightarrow 4 \text{H}_2\text{O} + \text{Sn}(\text{CNS})_4$.

8) (a) $2 \text{AgNO}_3 + \text{K}_2\text{CO}_3 \rightarrow \text{Ag}_2\text{CO}_3 + 2 \text{KNO}_3$; (b) $\text{Pb}(\text{NO}_3)_2 + 2 \text{NaCH}_3\text{CO}_2 \rightarrow \text{Pb}(\text{CH}_3\text{CO}_2)_2 + 2 \text{NaNO}_3$; (c) $2 \text{NH}_4\text{NO}_3 + \text{CaCl}_2 \rightarrow 2 \text{NH}_4\text{Cl} + \text{Ca}(\text{NO}_3)_2$; (d) $\text{MgCO}_3 + 2 \text{NaNO}_3 \rightarrow \text{Mg}(\text{NO}_3)_2 + \text{Na}_2\text{CO}_3$; (e) $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow 2 \text{NaCl} + \text{BaSO}_4$.

9) (a) $\text{C}_3\text{H}_8 + 5 \text{O}_2 \rightarrow 3 \text{CO}_2 + 4 \text{H}_2\text{O}$; (b) $\text{C}_2\text{H}_4 + 3 \text{O}_2 \rightarrow 2 \text{CO}_2 + 2 \text{H}_2\text{O}$.

- 10) (a) $\text{K}_2\text{O} + \text{H}_2\text{O} \rightarrow 2 \text{KOH}$; (b) $\text{MgO} + \text{H}_2\text{O} \rightarrow \text{Mg(OH)}_2$.
- 11) $\text{Ag}_2\text{O} + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{O} + \text{Ag}_2\text{SO}_4$; $\text{CuO} + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{O} + \text{CuSO}_4$.
- 12) (a) $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$; (b) $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$; (c) $\text{Cl}_2\text{O}_7 + \text{H}_2\text{O} \rightarrow 2 \text{HClO}_4$; (d) $\text{P}_2\text{O}_3 + 3 \text{H}_2\text{O} \rightarrow 2 \text{H}_3\text{PO}_3$; (e) $\text{Cl}_2\text{O}_3 + 2 \text{NaOH} \rightarrow \text{H}_2\text{O} + 2 \text{NaClO}_2$; (f) $\text{I}_2\text{O}_5 + \text{Mg(OH)}_2 \rightarrow \text{H}_2\text{O} + \text{Mg(IO}_3)_2$.
- 13) (a) $\text{Al}_2\text{O}_3 + 6 \text{HCl} \rightarrow 2 \text{AlCl}_3 + 3 \text{H}_2\text{O}$; (b) $\text{Al}_2\text{O}_3 + 2 \text{NaOH} \rightarrow 2 \text{NaAlO}_2 + \text{H}_2\text{O}$.
- 14) (a) $2 \text{HNO}_3 + \text{MgCO}_3 \rightarrow \text{Mg(NO}_3)_2 + \text{H}_2\text{O} + \text{CO}_2$; (b) $\text{HCl} + \text{NaHCO}_3 \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$.
- 15) (a) - 3; (b) 0; (c) + 5; (d) + 5; (e) + 2; (f) - 3.
- 16) (a) $2 \text{HNO}_3 + 3 \text{SnO} \rightarrow 2 \text{NO} + 3 \text{SnO}_2 + \text{H}_2\text{O}$; (b) $\text{MnO}_2 + 4 \text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2 \text{H}_2\text{O}$; (c) $3 \text{H}_2\text{S} + 2 \text{HNO}_3 \rightarrow 3 \text{S} + 2 \text{NO} + 4 \text{H}_2\text{O}$; (d) $2 \text{CuS} + 3 \text{O}_2 \rightarrow 2 \text{CuO} + 2 \text{SO}_2$; (e) $\text{I}_2\text{O}_5 + 5 \text{CO} \rightarrow \text{I}_2 + 5 \text{CO}_2$; (f) $\text{SnCl}_2 + 2 \text{HgCl}_2 \rightarrow \text{SnCl}_4 + \text{Hg}_2\text{Cl}_2$.