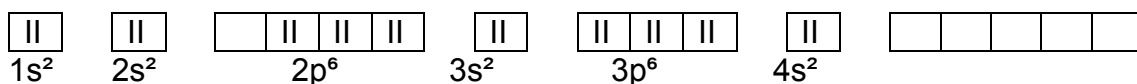
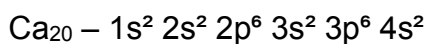


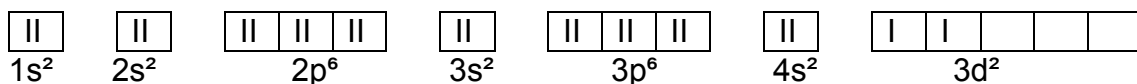
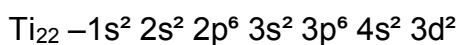
# QUÍMICA GERAL I – AULA 16 – 16° LISTA DE EXERCÍCIOS - GABARITO

## Configurações eletrônicas (paramagnetismo, diamagnetismo e ferromagnetismo)

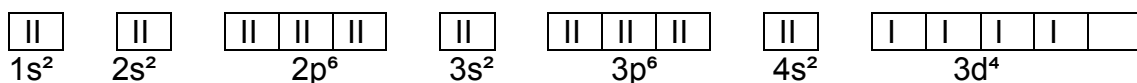
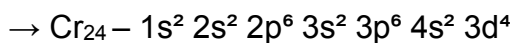
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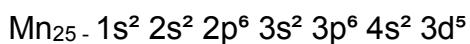
2)



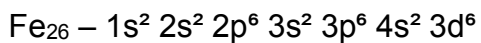
Paramagnético



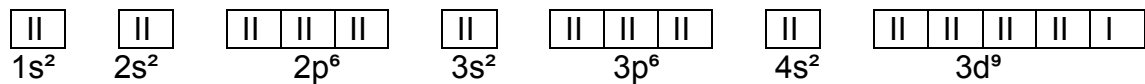
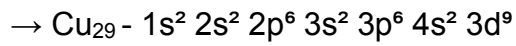
Paramagnético



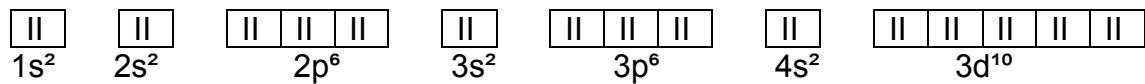
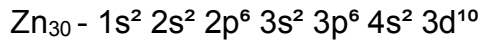
Paramagnético



Paramagnético

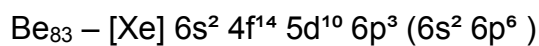
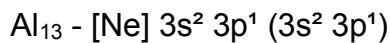
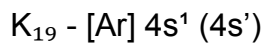


Paramagnético

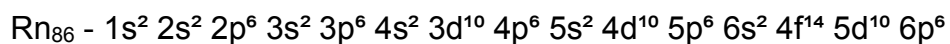
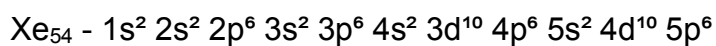
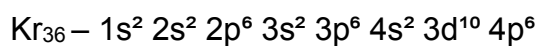
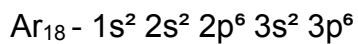
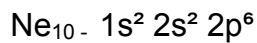
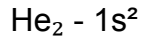


Diamagnético

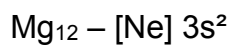
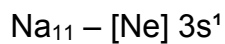
4)



5)



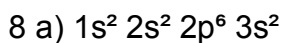
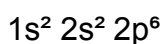
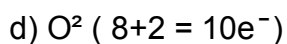
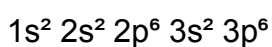
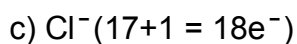
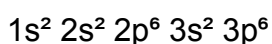
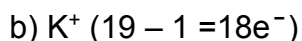
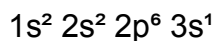
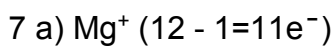
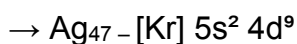
6 a)



b)

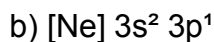


c)



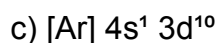
$$2+2+6+2 = 12 e^-$$

$$Z = 12 \text{ Mg}$$



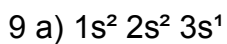
$$10+2+1 = 13 e^-$$

$$Z = 13 \text{ Al}$$

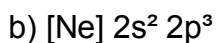


$$18+1+10 = 29$$

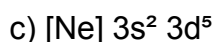
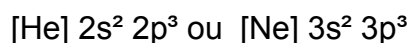
$$Z = 29 \text{ Cu}$$



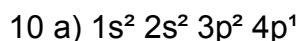
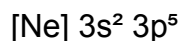
Segundo o diagrama de Linus Pauling, o princípio de Aufbau e a regra de Hund, devemos construir os orbitais em ordem crescente de energia. Desta forma a configuração eletrônica correta é:  $1s^2 2s^2 2p^1$ .



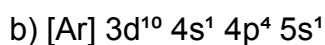
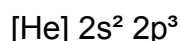
O Ne possui  $10 e^-$  tendo a seguinte configuração:  $1s^2 2s^2 2p^6$ . A configuração eletrônica apresentada está errada. O gás nobre deve ser o He, com  $2 e^-$ , ou os elétrons da camada mais externa devem estar na terceira camada.



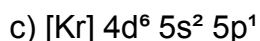
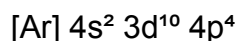
Obedecendo Pauli, Aufbau e Hund, os 5 e<sup>-</sup> que estão no subnível 'd' (mais energético) devem ocupar o subnível imediatamente mais energético que o 3s, no caso, o 3p.



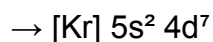
$$2+2+2+1 = 7 \text{ e}^- \quad (Z = 7 \rightarrow \text{N nitrogênio})$$



$$18+10+1+4+1 = 34 \text{ e}^- \quad (Z = 34 \rightarrow \text{Se selênio})$$



$$36+6+2+1 = 45 \text{ e}^- \quad (Z=45 \rightarrow \text{Rh ródio})$$

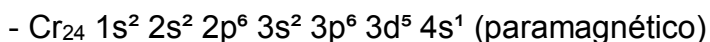


→ Tendência pelo diagrama de Linus Pauling

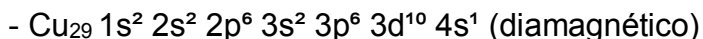
- Observação

Os elementos identificados com " → " são exceções.

A configuração eletrônica desses átomos mais pesados não seguem a ordem de energia do diagrama de Linus Pauling. Na verdade, o que apresentarei a seguir como "a forma correta" são formas encontradas para tentar explicar comportamentos observados em análises experimentais.



Neste caso o semi-preenchimento dos orbitais d fazem com que a energia do orbital 3d diminua, ficando, portanto, menos energético que o 4s.



A explicação para a mudança na ordem de energia dos orbitais é o preenchimento completo dos orbitais d. Observou-se experimentalmente que o Cu é diamagnético. A explicação deste fato é que o e<sup>-</sup> desemparelhado encontra-se em um orbital mais penetrante(s) sendo, portanto, blindado pelos elétrons emparelhados da camada d.

- Ag<sub>47</sub> 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>6</sup> 4s<sup>2</sup> 3d<sup>10</sup> 4p<sup>6</sup> 4d<sup>10</sup> 5s<sup>1</sup>

[Kr] 4d<sup>10</sup> 5s<sup>1</sup>

- Pt<sub>78</sub>

[Xe] 4f<sup>14</sup> 5d<sup>9</sup> 6s<sup>1</sup>

- Rh<sub>45</sub>

[Kr] 4d<sup>8</sup> 5s<sup>1</sup>