##### Nome: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ No. USP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

##### Nome: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ No. USP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Professor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Data: \_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_\_\_

#### Parte A: POTENCIAIS DAS CÉLULAS ELETROQUÍMICAS

**Potenciais medidos experimentalmente**

Fe|FeSO4||CuSO4|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Zn|ZnSO4||FeSO4|Fe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Zn|ZnSO4||CuSO4|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Escreva as semi-reações (em equilíbrio) que ocorrem nas diferentes células e apresentar os valores de seus potenciais padrão encontrados na literatura:

Fe|FeSO4||CuSO4|Cu

Lado esquerdo: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Eo  = \_\_\_\_\_\_\_\_\_\_\_\_\_

Lado direito: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Eo  = \_\_\_\_\_\_\_\_\_\_\_\_\_

TOTAL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Eo = \_\_\_\_\_\_\_\_\_\_\_\_\_

Zn|ZnSO4||FeSO4|Fe

Lado esquerdo: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Eo  = \_\_\_\_\_\_\_\_\_\_\_\_\_

Lado direito: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Eo  = \_\_\_\_\_\_\_\_\_\_\_\_\_

TOTAL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Eo = \_\_\_\_\_\_\_\_\_\_\_\_\_

Zn|ZnSO4||CuSO4|Cu

Lado esquerdo: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Eo  = \_\_\_\_\_\_\_\_\_\_\_\_\_

Lado direito: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Eo  = \_\_\_\_\_\_\_\_\_\_\_\_\_

TOTAL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Eo = \_\_\_\_\_\_\_\_\_\_\_\_\_

Explique as diferenças eventualmente encontradas entre os valores de potenciais padrão obtidos na literatura e aqueles obtidos experimentalmente

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#### Parte B: POTENCIAIS DAS CÉLULAS ELETROQUÍMICAS – EFEITO DA CONCENTRAÇÃO

**Potenciais medidos experimentalmente**

Cu|CuSO4 (c1 = 1 M)||CuSO4 (c2 = 1 M)|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cu|CuSO4 (c1 = 0,1 M)||CuSO4 (c2 = 1 M)|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cu|CuSO4 (c1 = 0,01 M)||CuSO4 (c2 = 1 M)|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calcular estas diferenças usando a equação:

E = Eo - 0,059/n log ([Cu2+(c2) / [Cu2+(c1)])

Lembrete: em função do fato de que os equilíbrios envolvem as mesmas espécies químicas nas duas semi-células o potencial padrão Eo será igual a zero.

Cu|CuSO4 (c1 = 1 M)||CuSO4 (c2 = 1 M)|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cu|CuSO4 (c1 = 0,1 M)||CuSO4 (c2 = 1 M)|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explique as diferenças eventualmente encontradas entre os valores de potenciais teóricos e aqueles obtidos experimentalmente

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**Parte C: DETERMINAÇÃO DO PRODUTO DE SOLUBILIDADE DO CuCO3**

**Valor obtido para o potencial da célula**

Cu|Cu+2/CuCO3 (c1 = ?)||Cu(NO3)2 (c2 = 1 M)|Cu \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Utilize a equação de Nernst para obter o valor de c1. Utilize esta concentração bem como o valor a concentração de CO32- na célula da esquerda na representação acima para calcular o produto de solubilidade do CuCO3. Lembrete: em função do fato de que os equilíbrios envolvem as mesmas espécies químicas nas duas semi-células o potencial padrão Eo será igual a zero.

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Compare com o valor que pode ser encontrado na literatura.

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