UNIVERSIDAD DE PUERTO RICO

RECINTO UNIVERSITARIO DE MAYAGÜEZ

DEPARTAMENTO DE QUÍMICA

**QUIM 4101**

LABORATORIO DE QUÍMICA FÍSICA I

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Sección: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Experimento: Solubilidad como función de temperatura y calor diferencial de disolución*

1. Objetivo

Determinar la solubilidad de ácido oxálico en agua a diferentes temperaturas y calcular el calor diferencial de disolución.

II- Data experimental y cálculos

|  |  |
| --- | --- |
|  | 20 mL |
|  | 0.1061 g/mol |
|  | 3.53 mL |
|  | 0.601133 |
|  | 90.03488 g/mol |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| muestra | temp© | peso de la soln (g) | V NaOH (mL) | peso del agua (g) | peso de acido oxalico (g) | moles de acido oxalico (mol) | molalidad (m) |
| 1 | 6.0 | 5.0828 | 10.50 | 3.9462 | 1.13658 | 1.262E-02 | 3.199E-03 |
| 2 | 6.0 | 5.0511 | 10.70 | 3.8929 | 1.15823 | 1.286E-02 | 3.305E-03 |
| 3 | 15.9 | 5.0328 | 10.45 | 3.9016 | 1.13117 | 1.256E-02 | 3.220E-03 |
| 4 | 15.9 | 5.0549 | 10.40 | 3.9291 | 1.12576 | 1.250E-02 | 3.182E-03 |
| 5 | 26.0 | 5.0693 | 10.40 | 3.9435 | 1.12576 | 1.250E-02 | 3.171E-03 |
| 6 | 26.0 | 5.0674 | 10.45 | 3.9362 | 1.13117 | 1.256E-02 | 3.192E-03 |
| 7 | 35.0 | 5.0487 | 10.50 | 3.9121 | 1.13658 | 1.262E-02 | 3.227E-03 |
| 8 | 35.0 | 5.0576 | 10.41 | 3.9308 | 1.12684 | 1.252E-02 | 3.184E-03 |

III-Datos para la construcción de la gráfica

|  |  |  |  |
| --- | --- | --- | --- |
| **Temperatura**  **(k)** | **Molalidad (m)** | **1/T** |  |
| 279.15 | 3.199E-03 | 3.582E-03 | -5.74493 |
| 279.15 | 3.305E-03 | 3.582E-03 | -5.71245 |
| 289.05 | 3.220E-03 | 3.460E-03 | -5.73834 |
| 289.05 | 3.182E-03 | 3.460E-03 | -5.75016 |
| 299.15 | 3.171E-03 | 3.343E-03 | -5.75382 |
| 299.15 | 3.192E-03 | 3.343E-03 | -5.74717 |
| 308.15 | 3.227E-03 | 3.245E-03 | -5.73625 |
| 308.15 | 3.184E-03 | 3.245E-03 | -5.74961 |

Grafique  vs 1/T y obtenga el calor diferencial de disolución a cada una de las temperaturas estudiadas. Complete la siguiente tabla:

|  |  |  |
| --- | --- | --- |
| **Temperatura (K)** | **Molalidad (m)** |  |
| 279.15 | 3.252E-03 | -8.3408E+07 |
| 289.05 | 3.201E-03 | -8.0561E+07 |
| 299.15 | 3.181E-03 | -7.7850E+07 |
| 308.15 | 3.205E-03 | -7.5583E+07 |

Datos Teóricos:

|  |  |  |  |
| --- | --- | --- | --- |
| T | m | 1/T | ln(m) |
| 280.15 | 6.68E-04 | 3.570E-03 | -7.31074 |
| 285.15 | 8.88E-04 | 3.507E-03 | -7.02701 |
| 299.15 | 1.32E-03 | 3.343E-03 | -6.62971 |
| 318.95 | 1.85E-03 | 3.135E-03 | -6.29522 |
| 323.45 | 2.29E-03 | 3.092E-03 | -6.08029 |
| 338.15 | 3.01E-03 | 2.957E-03 | -5.80629 |
| 351.25 | 4.39E-03 | 2.847E-03 | -5.4275 |

no se pudo conseguir datos iguales so cogi los data points mas cercas

|  |  |  |
| --- | --- | --- |
| T(k) | 1/T | (J) |
| 280.15 | 3.570E-03 | -7.373E+06 |
| 285.15 | 3.507E-03 | -7.167E+06 |
| 299.15 | 3.343E-03 | -6.626E+06 |
| 318.95 | 3.135E-03 | -5.943E+06 |
| 323.45 | 3.092E-03 | -5.799E+06 |
| 338.15 | 2.957E-03 | -5.356E+06 |
| 351.25 | 2.847E-03 | -4.993E+06 |

IV- Incluya la discusión de resultados y una conclusión breve.

Referencias:

* "Oxalic Acid | C2H2O4 - Pubchem". *Pubchem.ncbi.nlm.nih.gov*. N.p., 2016. Web. 8 Mar. 2016. - <https://pubchem.ncbi.nlm.nih.gov/compound/oxalic_acid#section=Top>
* "CHEMISTRY 122 - LAB: CORRECTIONS, SUGGESTIONS, PRELAB AND REPORT QUESTIONS - EXP 15". *Chemistry.osu.edu*. N.p., 2016. Web. 18 Mar. 2016. - https://chemistry.osu.edu/~rzellmer/chem122/lab/exp15.pdf