**Homework #3 : Calibration Curves & Intro to UV-VIS methods 20 pts total**

*Due Wednesday 13 February*

*Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* 1. The following standard addition data is obtained where the standard solution volume

is 5 mL and the concentration of Cu2+ in the standard addition reference is 20 ppm.

Assume the solutions are all made up to a total of 50 mL. and that 1 standard volume

of the unknown is present in all the solutions below.

**Cu2+ Standard addition # vs observed Absorbance of Cu at 680 nm**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Reference Std addition#** | **0** | **1** | **2** | **3** | **4** |
| **A(Cu2+)** | **0.16** | **0.29** | **0.42** | **0.54** | **0.67** |

Use linear regression to find the concentration of the unknown Cu2+ in ppm

Unknown [Cu2+(ppm)] = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *3 pts*

* 1. **Term Matching (10 pts)**

1. echelle
2. 1800 oC
3. Lvov platform
4. 10,000 oC
5. Chemical broadening
6. echellette
7. Ar
8. ICP
9. Rowland circle
10. Electrothermal AAS

**Graphite tube for sample in HGA \_\_\_\_\_**

**Gas excited in ICP \_\_\_\_\_**

**`Special 2D’ grating in modern ICP \_\_\_\_\_**

**Classic ICP design \_\_\_\_\_**

**Other name for graphite furnace AAS \_\_\_\_\_**

**Old style ICP monochromator \_\_\_\_\_**

**Temperature attained in HGA \_\_\_\_\_**

**Temperature attained in ICP \_\_\_\_\_**

**Absorption method \_\_\_\_\_**

**Emission method \_\_\_\_\_**

* 1. **Atomic Spectroscopy Trivia (7 pts)**

**Name three sources of line broadening in AAS (see Skoog)**

**a)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**b)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**c)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is a releasing agent ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Short-lived alternative AAS source to HCL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**One practical advantage of ICP over flame AAS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**What is the `Achilles heel’ of AAS methods ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**