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Unit 9 - Week 6

Assignment 6

The due date for submitting this assignment has passed. Due on 2020-03-11, 23:59 IST.
As per our records you have not submitted this assignment.

1) The steps that could have systematic errors in the calibration of the burette experiment ***2 points***

- [ ] fluctuations in the temperature
- [ ] using an uncalibrated thermometer
- [ ] weighing the mass of conical flask that is not completely dried
- [ ] using an uncalibrated weighing balance
- [ ] burette that is not appropriately filled
- [ ] using ultra-pure water
- [ ] assuming each addition of 2 mL would result in exactly 2 g increase in weight
- [ ] fluctuations in the voltage supply that connects to the weighing balance

No, the answer is incorrect.
Score: 0

Accepted Answers:
using an uncalibrated thermometer
using an uncalibrated weighing balance
burette that is not appropriately filled

2) The steps that could have resulted in random errors in the calibration of the burette experiment ***2 points***

- [ ] fluctuations in the temperature
- [ ] using an uncalibrated thermometer
- [ ] weighing the mass of conical flask that is not completely dried
- [ ] using an uncalibrated weighing balance
- [ ] burette that is not appropriately filled
- [ ] using ultra-pure water

- [ ] assuming each addition of 2 mL would result in exactly 2 g increase in weight
- [ ] fluctuations in the voltage supply that connects to the weighing balance

No, the answer is incorrect.
Score: 0
Accepted Answers:
fluctuations in the temperature
fluctuations in the voltage supply that connects to the weighing balance

3) The steps that could have personal errors in the calibration of the burette experiment ***2 points***

- fluctuations in the temperature
- using an uncalibrated thermometer
- weighing the mass of conical flask that is not completely dried
- using an uncalibrated weighing balance
- burette that is not appropriately filled
- using ultra-pure water
- assuming each addition of 2 mL would result in exactly 2 g increase in weight
- fluctuations in the voltage supply that connects to the weighing balance

No, the answer is incorrect.
Score: 0
Accepted Answers:
assuming each addition of 2 mL would result in exactly 2 g increase in weight

A researcher would like to know concentration of a chemical he had synthesized to determine the overall yield. However, since it is a liquid that couldn't be purified further and he knows that the impurities, if any, do not absorb UV light he is resorting to using UV-visible spectrophotometry for this purpose. Fortunately, he is able to obtain the same chemical (a liquid) from a chemical inventory with which he calibrates the instrument. For the values given below, perform a linear fit using a spreadsheet program and provide the slope, intercept and R^2 value.

c (M) = 0.012, 0.020, 0.052, 0.072, 0.092, 0.100
A (units) = 0.090, 0.150, 0.390, 0.540, 0.690, 0.750

4) Slope = _____

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 7.4,7.6

2 points

5) Intercept =_____

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 0

1 point

6) R^2 value = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 1

1 point

7) Using the calibration curve that you have obtained above, determine the concentration of the sample when an absorbance of 0.45 is measured(Round off the answer upto 3 decimal points)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 0.060

2 points

Determine the heat of dissolution of a fictitious weak monoprotic acid (165 g/mol) for the data provided below using a spreadsheet program. Assume that NaOH has been standardized and the concentration equal to 0.025 N. V_NaOH is the volume of standardized NaOH (mL) required for 10 mL aliquots of the weak acid at the given temperature. Concordant values, so provided only once in this example

Temp (ºC) : 30, 33, 36, 39, 42, 45
V_NaOH (mL) : 10.0, 12.1, 13.5, 15.0, 17.0, 19.5

8) $\Delta H°(kJ/mol)$ = _____

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 33,35

4 points

9) R^2 value

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.99,1.00

1 point

From the list of provided data, determine the order of reaction and also its rate constant (units not required, round off to two decimals). Hint: all data are simulated and expected to yield R^2 of close to 1.0 to make the problem easy

time (s) = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

conc_A = 1.000, 0.607, 0.368, 0.223, 0.135, 0.082, 0.050, 0.030, 0.018, 0.011, 0.007, 0.004, 0.002, 0.002, 0.001, 0.001

conc_B = 1.000, 0.667, 0.500, 0.400, 0.333, 0.286, 0.250, 0.222, 0.200, 0.182, 0.167, 0.154, 0.143, 0.133, 0.125, 0.118

conc_C = 1.000, 0.800, 0.667, 0.571, 0.500, 0.444, 0.400, 0.364, 0.333, 0.308, 0.286, 0.267, 0.250, 0.235, 0.222, 0.211

conc_D = 1.000, 0.779, 0.607, 0.472, 0.368, 0.287, 0.223, 0.174, 0.135, 0.105, 0.082, 0.064, 0.050, 0.039, 0.030, 0.024

10) For A, the order is

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 1

1 point

11) For A, the rate constant is _____ units

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.49,0.51

1 point

12) For B, the order is

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2

1 point

13) For B, the rate constant is _____ units

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.49,0.51

1 point

14) For C, the order is

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2

1 point

15) For C, the rate constant is _____ units

No, the answer is incorrect.
Score: 0
Accepted Answers:

(Type: Range) 0.24,0.26

1 point

16) For D, the order is

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 1

1 point

17) For D, the rate constant is _____ units

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 0.24,0.26

1 point