Determination of the heat of hydration of bivalent copper sulphate pentahydrate

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Contents

1 Introduction

Purpose of work: to determine the heat of formation of crystalline hydrate $CuSO_4 \cdot 5H_2O$.

The heat of formation of crystalline hydrate $CuSO_4 \cdot 5H_2O$ will correspond to the reaction of addition of 5 moles of water to 1 mole of anhydrous salt according to the equation:

$$CuSO_4\,(s) + 5H_2O\,(l) = CuSO_4 \cdot 5H_2O\,(s), \qquad \Delta_{hyd}H^{\circ} \tag{1}$$

The thermal effect cannot be determined experimentally, because the formation of a new phase from liquid to solid phase is very slow and incomplete. Theoretical calculation of the thermal effect is carried out on the basis of Hess's law on the basis of the following cycle:

$\Delta_{sol}H^{\circ}{}_{dry}$ and $\Delta_{sol}H^{\circ}{}_{hyd}$ - integral heats of dissolution of anhydrous salt and crystalline hydrate, respectively.

They are related by the following relationship:

$$\Delta_{hyd}H^{\circ} = \Delta_{sol}H^{\circ}{}_{dry} - \Delta_{sol}H^{\circ}{}_{hyd} \tag{2}$$

Also, the calorimeter constant must be determined before determining thermal effects.

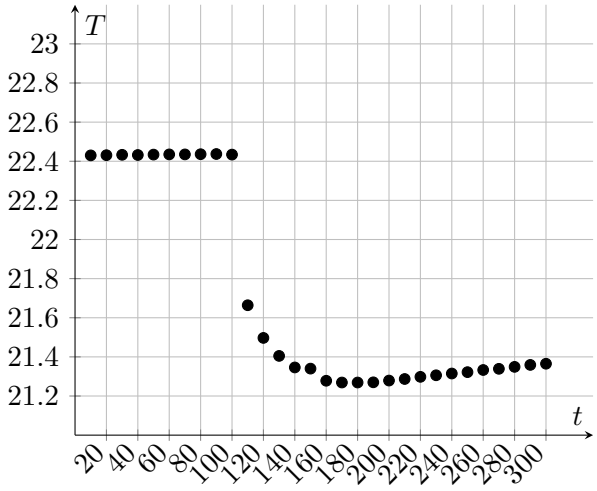
2 Methods

do this, then this, and so on

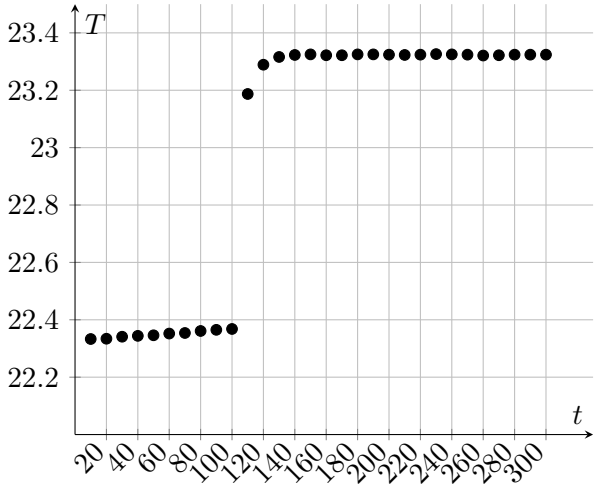
3 Results

Impressive Results

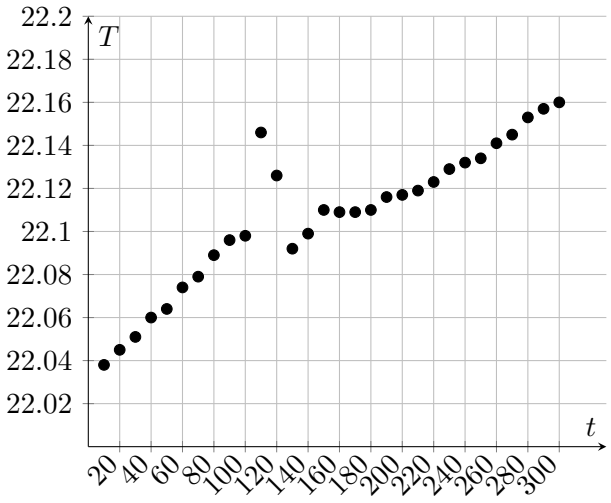
3.1 First experiment



3.2 Second experiment



3.3 Third experiment



4 Conclusions

bla-bla-bla

5 References

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