

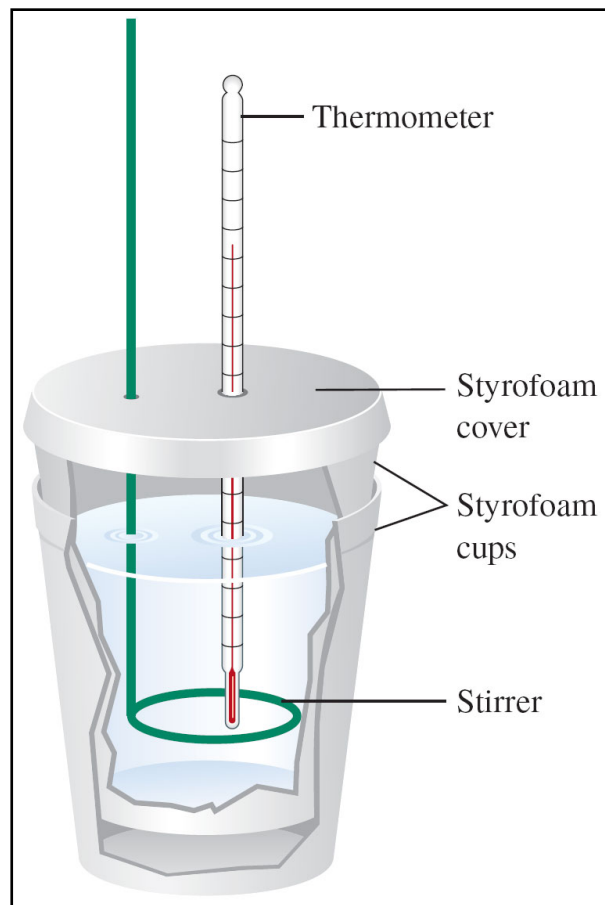
Lecture 8

Entropy Introduction

Lecture Room

The 1 pm lecture for the rest of the summer will be in 100 Noyes Lab.

Figure 6.5: Coffee-cup Calorimeter



Lecture Question 1

Consider the seven processes described on p. 16 of the Handouts packet. How many of these processes have a positive value for ΔS_{sys} ?

- a. 2 b. 3 c. 4 d. 5 e. 6 f. 7 (all)

Lecture Question 1

Consider the seven processes described on p. 16 of the Handouts packet. How many of these processes have a positive value for ΔS_{sys} ?

- a. 2 b. 3 c. 4 d. 5 e. 6 f. 7 (all)

Processes 2, 3, 5, and 7 all have positive values for ΔS_{sys} . All of these processes show an increase in positional probability as reactants are converted to products.

Lecture Question 2

Consider the six processes described on p. 19 of the Handouts packet. How many of these processes have a positive value for ΔS_{surr} ?

- a. 1 b. 2 c. 3 d. 4 e. 5 f. 6 (all)

Lecture Question 2

Consider the six processes described on p. 19 of the Handouts packet. How many of these processes have a positive value for ΔS_{surr} ?

- a. 1 b. 2 c. 3 d. 4 e. 5 f. 6 (all)

Only processes 3, 4 and 6 are exothermic, so only these three processes have positive ΔS_{surr} values.

Lecture Question 3

Consider the six processes described on p. 19 of the Handouts packet. How many of these processes must have a positive value for ΔS_{univ} (are always spontaneous)?

- a. 1 b. 2 c. 3 d. 4 e. 5 f. 6 (all)

Lecture Question 3

Consider the six processes described on p. 19 of the Handouts packet. How many of these processes must have a positive value for ΔS_{univ} (are always spontaneous)?

- a. 1 b. 2 c. 3 d. 4 e. 5 f. 6 (all)

$\Delta S_{\text{univ}} = \Delta S_{\text{sys}} + \Delta S_{\text{surr}}$; only process 3 always has a positive value for ΔS_{univ} since ΔS_{sys} and ΔS_{surr} are both positive, so only this process will always be spontaneous.