

WORKSHEETS ARE DUE AT THE BEGINNING OF CLASS ON THE DATE GIVEN ON THE WORKSHEET. LATE WORKSHEETS WILL NOT BE ACCEPTED.

NAME _____

Panther ID _____

For problems involving calculations you must show your work for credit.

1) HCFC-123 is a partially halogenated hydrocarbon that is currently used in refrigeration and air conditioning systems. It has the chemical formula CHCl_2CF_3 , and is a gas at room temperature.

Give the formation reaction for $\text{CHCl}_2\text{CF}_3(\text{g})$.

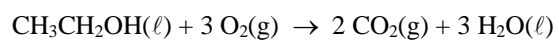
2) For each of the following processes, indicate whether the process is or is not spontaneous. If there is not sufficient information to tell whether the process is or is not spontaneous, say "cannot tell".

ΔS_{sys}	ΔS_{surr}	Process is spontaneous? (yes / no / cannot tell)
positive	positive	_____
negative	positive	_____
negative	negative	_____
positive	zero	_____

3) Which of the following is a state function?

- a) heat (q)
- b) enthalpy (H)
- c) entropy (S)
- d) both b and c
- e) both a and b and c

4) Using the data given below, find $\Delta H^\circ_{\text{rxn}}$ and $\Delta S^\circ_{\text{rxn}}$ for the following reaction (which is the combustion reaction for ethanol), taking place at $T = 298. \text{ K}$. Data are also given at $T = 298. \text{ K}$.



substance	ΔH°_f (kJ/mol)	ΔG°_f (kJ/mol)	S° (J/mol·K)
$\text{CH}_3\text{CH}_2\text{OH}(\ell)$	- 276.98	- 174.18	161.0
$\text{CO}_2(\text{g})$	- 393.5	- 394.4	213.6
$\text{H}_2\text{O}(\ell)$	- 285.8	- 237.2	69.9
$\text{O}_2(\text{g})$	0.0	0.0	205.0