Exercise 6.4
Entropy: System, Surroundings and Universe

1. For each of the following statements, circle the appropriate choice from ALWAYS, SOMETIMES or NEVER. If answer is SOMETIMES, describe the circumstances under which the reaction is thermodynamically allowed.

(a) A reaction which increases the entropy of the system is ALWAYS/SOMETIMES/NEVER thermodynamically allowed.

(b) A reaction which increases the entropy of the surroundings is ALWAYS/SOMETIMES/ NEVER thermodynamically allowed.

(c) A reaction which increases the entropy of the universe is ALWAYS/SOMETIMES/ NEVER thermodynamically allowed.

(d) A reaction which decreases the entropy of the system is ALWAYS/SOMETIMES/NEVER thermodynamically allowed.

(e) A reaction which decreases the entropy of the surroundings is ALWAYS/SOMETIMES/ NEVER thermodynamically allowed.

(f) A reaction which decreases the entropy of the universe is ALWAYS/SOMETIMES/ NEVER thermodynamically allowed.

2.

(a) Give an example of one way in which a reaction can increase the entropy of the system.

(b) Give an example of one way in which a reaction can increase the entropy of the surroundings.

(c) Give an example of one way in which a reaction can decrease the entropy of the system.

(d) Give an example of one way in which a reaction can decrease the entropy of the surroundings.