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2016, 2

Points 2, 2, 1, 2, 2, 1

(a) Acid-base. $HC_2H_3O_2$ acts as a Brønsted-Lowry acid by donating a H^+ to HCO_3^-.

(b) Moles of $NaHCO_3 = \frac{2.24\ g}{(22.99+1.008+12.01+48)} = 0.0267$ moles

Moles of $HC_2H_3O_2 = (0.060)\ (0.875) = 0.0525$ moles

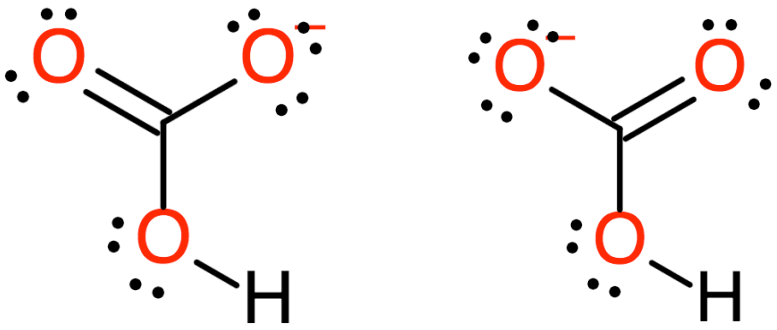
Since ratio is 1:1, $NaHCO_3$ is the limiting reactant.

(c) The concentration of the acid decreases over time, meaning fewer collisions between reactant particles.

(d) (i) Entropy only.

(ii) In order for a reaction to be thermodynamically favorable, ΔG° must be negative. Given that ΔH° is positive in this reaction, and that $\Delta G° = \Delta H° - T\Delta S°$, then ΔS° must be positive for ΔG° to be negative.

(e) Two, resonance structures as below.



(f) $C_2H_3O_2^- + H^+ \rightarrow HC_2H_3O_2$