

54. ① ~~no~~ pH is not an intrinsic property of a system.
It is determined by $[H_3O^+]$ which is determined
by an acid or base's K_a or K_b and its concentration.

② pK_a is an intrinsic property of a solution.

③ pH is an ion concentration while pK_a measures
the degree of dissociation. Both of the former
are not intrinsic values while both of the latter
are intrinsic values.

56. (a) K increases with temperature so the reaction is
endothermic.

(b) neutral (c) neutral (and at all temps)

(d) But pH changes (wind, huh?)

$$K_w = 1.5 \times 10^{-13}$$

$$x^2 = 1.5 \times 10^{-13}$$

$$x = 3.87 \times 10^{-7}$$

$$pH = -\log x = 6.41$$