Polyprotic ionization is complex.

Ionization microconstants are individual group properties, but they strongly depend on the protonation state of other groups and are tricky to obtain.

Averaged Single Proton Acidity (ASPA) continuously follows a group's acidity changes affected by protonation of other groups as a function of pH. ASPA can be thus interpreted as a population-averaged "micro pH".

Averaged Site Protonation (ASP) focuses on a single group occupation as a function of pH and resembles titration curves. The midpoint of these curves is $pK_{50}$.

It can be shown that:

$$\text{ASP}(G) = \frac{[\text{H}^+]}{[\text{H}^+] + \text{ASPA}(G)}$$

Single Proton Midpoint ($pK_{\text{MP}}$) is a property of an individual ionizable group (G). Defined analogously to a monoprotic $pK_a$:

$$pK_{\text{MP}}(G) = pH_{\text{midpoint}} \text{ where ASP}(G) = 50\%$$

References: