

What is pKa and how is it related to pH in HPLC mobile phases and sample diluents - FAQ

Apparent pKa also known as the acid dissociation constant is a measure of the apparent overall acidity of a compound while the pKb is a measure of the apparent overall basicity of a compound. pH is a measure of the acidity or alkalinity of an aqueous solution.

If a pH value of a solution equals the pKa/pKb a compound in that solution then approximately 50% of the compound will be neutral and 50% will be ionized in a constant state of equilibrium and change.

This is a very unstable situation for HPLC or CE. In practical and layman terms, we can define pKa as the pH at which 50% is ionized and 50% is neutral. This equation holds for aqueous solutions mostly so pH and pKa can be different when organic solvents (e.g. acetonitrile) are present.

For the purposes of HPLC and CE, it is highly recommended that any run buffer, mobile phase or sample diluent be made at least one full pH unit above or below the pKa or pKb of the analytes when possible for increased method precision.