Infrared and visible absolute and difference spectra of bacteriorhodopsin photocycle intermediates.

We have used new kinetic fitting procedures to obtain infrared (IR) absolute spectra for intermediates of the main photocycle: M(0) → M(1) → M(F) → M(2) → M(1) → M(0). Infrared absolute spectra of intermediates during the M(F) → M(0) pathway are the first such absolute spectra obtained for bacteriorhodopsin. Notably, the Arg82 deprotonation occurs exclusively in the M(F) pathway of the parallel cycles model of the photocycle.