Palladium catalyzed allylic alkylations are important reactions in organic synthesis. In general stabilized carbanions are used as soft C-nucleophiles. Nonstabilized enolates from ketones and esters often cause problems, and the developments and improvements made with these interesting nucleophiles are summarized in this review.

With respect to ketone enolates, best results are obtained with the corresponding tin derivatives, but enoxyborates also can be used. With ketone enolates $\alpha$-allylated products are obtained. In the presence of suitable chiral ligands, the optically active substitution products are obtained with high stereoselectivity. In contrast, sterically hindered ester enolates do not provide allylation products, but give rise to cyclopropane derivatives, while with silylketene acetics as nucleophiles, or vinyl epoxides as allylic substrates, the $\alpha$-allylated products are obtained as well. This is also true with more or less stabilized enolates derived from pyrazinones or azlactones, giving rise to $\alpha$-alkylated amino acid derivatives. “Normal” unsaturated amino acids can be obtained by using chelated amino acid ester enolates as nucleophiles. This enolates show a high reactivity and therefore these reactions can be carried out under very mild conditions, conditions under which the $\pi$-σ-$\pi$-isomerization of the $\pi$-allyl intermediates can be suppressed. This opens up totally new synthetic possibilities. In the presence of chiral ligands optically active amino acids are obtained.