

**The application of transition metal catalysis for selective cyclocarbonylation reactions.  
Synthesis of lactones and lactams.**

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**Abstract**

A variety of 5-, 6-, and 7-membered ring lactones and lactams have become available via carbonylative cyclization reactions catalyzed by different transition metal complexes. Palladium and rhodium complexes are the most widely used catalysts for the cyclization reactions. Furanones can be synthesized either by the catalytic intermol. cyclocarbonylation of iodoarenes with alkynes or alkynols, or by intramol. cyclocarbonylation of alkynols.  $\gamma$ -Butyrolactones are mainly prepd. by the intramol. cyclocarbonylation of allyl alc. derivs. catalyzed by palladium(0) complexes and 1,4-bis(diphenylphosphino)butane (dppb). The replacement of dppb by a chiral ligand leads to the formation of optically active  $\gamma$ -butyrolactones. Furthermore, 5-, 6-, and 7-membered ring bicyclic and polycyclic lactones and lactams are obtained by the Pd(II) catalyzed intramol. cyclocarbonylation of 2-allylphenol and 2-allylaniline derivs. in the presence of syngas. The regiochem. control of the reaction depends on the choice of solvent, the nature of the metal and added ligand, and the relative pressures of the gases (CO and H<sub>2</sub>). A review with 34 refs.