

# Palladium-Catalyzed Amination in the Synthesis of Polyazamacrocycles

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**Abstract**—The review describes palladium-catalyzed amination of acyclic di- and polyamines with aryl halides with a view to reveal general relations holding in this process. Conditions for the synthesis of macrocycles via catalytic diamination of 1,2- and 1,3-dibromobenzenes, 1,3-dichloro-2-bromobenzene, 2,6- and 3,5-dibromopyridines, 3,3'- and 4,4'-dibromobiphenyls, 2,7-dibromonaphthalene, 1,8- and 1,5-dichloroanthracene, 1,8- and 1,5-dichloroanthraquinones, and bis(haloaryl) derivatives of cyclen, cyclam, and cholanediol are discussed. The possibility for palladium-catalyzed arylation of cyclic polyamines has been demonstrated. Specificity of macrocyclization processes and relations between the yield of macrocycles and the nature of initial compounds are considered, and data on the synthesis of cyclic dimers are given. Applications of polyazamacroheterocycles as optical sensors for metal cations are described using as examples macrocyclic compounds derived from 1,8-disubstituted anthraquinone.