

Keynote GC2

Highly Selective Stepwise Reduction of Polynitro Aromatic Compounds

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Aromatic nitroamines, diamines and threamines used widely as intermediates in the production of polymers, pigments, pesticides, dyes, and drugs. As a rule, the aromatic nitro-amines and polyamines are obtained by reduction of relevant polynitrocompounds using several approaches, including the catalytic hydrogenation by hydrogen, reduction of iron shaving or sulphurous sodium, hydride transfer with hydrazine hydrate. The use of expensive metals as catalysts, the formation of large quantities of wastewater, insufficient selectivity are the main disadvantage of these variants of the process. All available methods of reduction of aromatic polynitro-compounds are not universal.

We found that the reduction of polynitroarenes can be carried out using supercritical alcohols as a source of hydrogen in a flow reactor in the presence of alumina at temperatures 200-320°C and residence times not exceeding ~ 6 min. The proposed system allowed us to carry out the stepwise reduction of polynitroarenes, leading to the formation of the respective nitroamines and polyamines with high conversion and selectivity. Degree of reduction is regulated only by the reaction temperature under other constant parameters. Compounds containing nitrogroups in various aromatic rings can be used as substrates. Reduction of 2,2-dinitrophenyl leads to formation of 3,4-benzocinnoline in one preparative stage.