

Activation and regeneration of sponge metal catalysts

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The submitted work describes improvements in the regeneration and activity of commercially available nickel sponge catalysts. The principle of the developed procedure is to preserve or increase the activity of used nickel sponge catalyst by *in-situ* catalyst regeneration under mild conditions without further manipulation. The above-mentioned procedure requires an activator ABX, the consumption of which depends on the type of reaction, for which the catalyst is intended. The applicable amount of the activator ranges from decimal to unitary percents based on the amount of the catalyst introduced.

The regeneration procedure was tested experimentally in several model hydrogenation reactions with sponge nickel as the standard hydrogenation catalyst. The results show that the regeneration procedure can be applied advantageously in the hydrogenation of aldehydes, ketones, nitriles and nitro compounds, as well as in reduction of saccharides to polyols and reductive amination of aldehydes. However, as found during a series of experiments, the regeneration procedure must be appropriately tuned for each individual hydrogenation reaction.