As catalysts, copper-nickel alloys are less active than pure nickel by orders of magnitude for hydrodenoglysis of ethane to methane, but are severalfold more active for dehydrogenation of cyclohexane to benzene. Thus, the effects of alloying depend strongly on the nature of the reaction. [The SCI® indicates that this paper has been cited in over 250 publications.]

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Shortly after World War II, scientists became interested in using metal alloys as catalysts to probe the relationship between the catalytic activity of a metal and its electronic structure.\(^1\)\(^2\) Alloys consisting of one metal from Group VIII and another from Group IB of the periodic table, e.g., nickel-copper, were of particular interest.\(^3\) Emphasis was given to a few selected reactions, one of which was the hydrogenation of ethylene. Little or no attention was given to hydrogenolysis reactions of hydrocarbons, which involve scission of carbon-carbon bonds. The possibility that the effect of alloy composition on catalytic activity for this type of reaction could be very different from the effect for hydrogenation (or dehydrogenation) reactions was not appreciated, nor was the selectivity aspect of catalysis by metal alloys in general much appreciated. Results of research addressing this issue led to the paper that is the subject of this commentary.