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Process for reductive hydrolysis of nitriles

Description of Technology: This invention concerns processes for the reductive hydrolysis of nitriles to alcohols, including reductive hydrolysis of mononitriles to primary alcohols, selective reductive hydrolysis of dinitriles to hydroxynitriles and the reductive hydrolysis of dinitriles to diols.

Patent Listing:

1. **US Patent No.** 5,741,955, April 21, 1998, "Process for reductive hydrolysis of nitriles."
http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=5,741,955.PN.&OS=PN/5,741,955&RS=PN/5,741,955

Market Potential: Certain substrates, intermediates, or products can be simple hydrocarbyl nitriles such as capronitrile, with no other functionality present, or can be very complicated multifunctional molecules such as those encountered in agricultural and pharmaceutical syntheses. The great value of reductive hydrolysis stems from the fact that the nitrile group is one of the most versatile in organic chemistry. It can be introduced with great precision, including stereospecificity (for example by the use of asymmetric hydrocyanation catalysts), so that a wide range of very complex organic structures can be constructed containing carefully placed nitrile groups

Previously known catalysts for reductive hydrolysis reactions typically yield only low conversions and poor selectivity to the product, primary alcohols. In contrast, typical selectivities using the process of the present invention, for example, in the reductive hydrolysis of adiponitrile to hexanediol or 2-methylglutaronitrile to methylpentanediol are comparatively very high, with only traces of amine by-products being formed.

Benefits:

- The nitrile group is one of the most versatiles in organic chemistry.
- Nitriles can be introduced with great precision.
- Wide variety of very complex organic structures can be constructed.
- Very high conversions and good selectivity to the products after reductive hydrolysis reactions.

Applications:

- Agricultural processes.
- Pharmaceutical processes.

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