

Summary

A process for the preparation of *n*-butyraldehyde and/or *n*-butanol, in which

- 5 a) 1,3-butadiene is caused to react with an amine of the formula I



10 in which R^1 and R^2 independently denote hydrogen, optionally substituted aliphatic or cycloaliphatic radicals, or aryl or aralkyl radicals or are linked to form a bridging member which can contain hetero atoms, at elevated temperature and under superatmospheric pressure in the presence of a compound of a Group VIIIb element and in the presence of an alkali metal amide or a basic metal oxide to form a mixture of the adducts of the formulas II

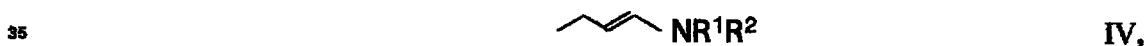


20 and III



- 25 b) the adduct III is isomerized to the adduct II,

- 30 c) the adduct II is isomerized in the presence of a homogeneous or heterogeneous transition metal element catalyst in the liquid phase or in the presence of a heterogeneous catalyst containing a transition metal element in the gaseous phase to form the enamine of the formula IV



and

- 40 d) *n*-butyraldehyde and/or *n*-butanol is/are produced from this enamine IV by the reaction thereof with hydrogen and water or water only in

the presence of a homogeneous or heterogeneous transition metal element catalyst in the liquid phase or in the presence of a heterogeneous transition metal element catalyst in the gaseous phase and in the presence of an acid or in the presence of one of said catalysts and an acid, and the amine I is liberated, and the liberated amine I is recycled to the stage defined above as partial reaction a).