

## OXIDATIVE DEHYDROGENATION OF MENTHOL IN A CONTINUOUS GAS PHASE PROCESS

Angela Koeckritz<sup>1</sup>, Anna Kulik<sup>1</sup>, Katja Neubauer<sup>1</sup>, Reinhard Eckelt<sup>1</sup> and Johannes Panten<sup>2</sup>

<sup>1</sup>University of Rostock, Germany

<sup>2</sup>Symrise AG, Germany

(-)-Menthone and (+)-isomenthone are used in the fragrance industry in synthetic peppermint oils and bases. They can be manufactured from menthol by oxidation with toxic chromic acid or catalytic dehydrogenation applying copper chromite. Various catalytic reactions for the synthesis of menthone/isomenthone in the liquid phase are described in the scientific literature. But from a sustainable point of view, a solventless process using heterogeneous catalysts would be desirable. In this study, the oxidative dehydrogenation of (-)-menthol to (-)-menthone and (+)-isomenthone in a flow reactor in the gas phase was investigated for the first time. Menthol was placed in a saturator and evaporated by the reactant/carrier gas of 5 vol% O<sub>2</sub>/95 vol% Ar. Type of catalysts, reaction temperatures, feed concentrations, residence times and catalyst amounts were varied. Best of the catalysts screened was found to be RuMnCe/CeO<sub>2</sub> with Ru contents of 0.5 to 1.0 wt%. A total yield of menthone + isomenthone up to 69% (at 74% total selectivity) was observed.

## BIOGRAPHY

Angela Koeckritz is a group leader at Leibniz Institute for Catalysis (LIKAT) in Rostock. Her research has long been focusing on catalytic reactions applied to fine chemicals. In particular, diverse catalytic oxidations using green oxidants, isomerisations and hydrogenations in the liquid and gas phase have been explored, mainly utilizing heterogeneous catalysts. Renewables such as fatty acid derivatives, terpenes or carbohydrates have served as feedstock. She studied chemistry and finished her PhD on an issue of heterocyclic chemistry at Humboldt University in Berlin in 1985. Then she became scientist in a research group dealing with phosphorus-containing compounds for pharmaceuticals and agrochemicals at the Academy of Sciences in Berlin. Since 1994, catalysis research in the liquid phase was in the focus of her interest during the work at the Institute for Applied Catalysis Berlin-Adlershof (ACA). In 2006, this institute merged with the Institute for Organic Catalysis Research in Rostock forming LIKAT.

[angela.koeckritz@catalysis.de](mailto:angela.koeckritz@catalysis.de)



Note: