Selective oxidation of secondary alcohols

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The development of catalytic methods for alcohol oxidation has been one of the most pursued targets in the last few years, due to the urgency of substituting stoichiometric oxidants used in the fine chemicals industry, often based on toxic metals with oxygen or air. Here we wish to report that a low loading supported copper catalyst is very effective in selective oxidation of non-activated secondary alcohols, under transfer dehydrogenation conditions. Thus, complete oxidation can be obtained in short reaction times and with excellent selectivities by using stirene (1 eq.) as hydrogen acceptor for a wide range of secondary alcohols [1]. In particular, both 3- and 2-octanone, employed as food additives, and carvone, one of the most sought-after flavor compds. [2] can be obtained in excellent yield under very mild experimental conditions. Moreover, competitive dehydrogenation of cyclooctanol and 1-octanol, shows that secondary alcohols can be selectively oxidized also in the presence of primary ones.

The system is efficient for at least six catalytic runs without relevant loss in activity nor in selectivity and allows the set up of a safe, simple and clean protocol

Table 1-

Substrate	**T (h)**	**Conv %**	**Sel %**
3-octanol	1.5	100	100
2-octanol	4	100	100
carveol	2.5	100	88
carveol[a]		100	95
4-tert-Bu-cyclohexanol	1.5	97	100
cyclooctanol	0.5	100	100
cyclododecanoll	2	97	100

[1] F. Zaccheria, N. Ravasio, R. Psaro, A. Fusi, Chem. Commun., **2005**, 253-255

[2] G., Kolomeyer, J. S. Oyloe (Millenium Chemicals) PCT Int. Appl. (**2004**) WO 2004108646