M. O'BRIEN, I. R. BAXENDALE, S. V. LEY* (UNIVERSITY OF CAMBRIDGE, UK)
Flow Ozonolysis Using a Semipermeable Teflon AF-2400 Membrane to Effect Gas–Liquid Contact
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Category

Polymer-Supported Synthesis

Key words

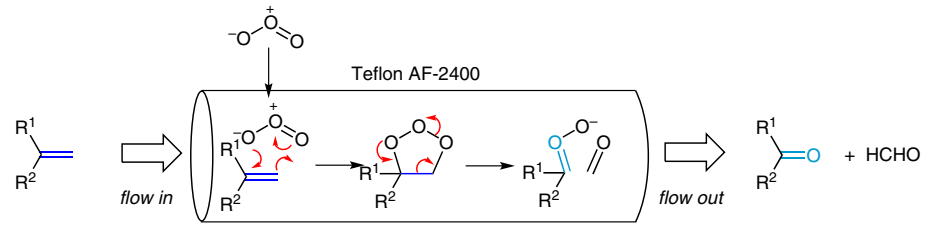
ozonolysis

semipermeable membranes

Teflon AF-2400

flow chemistry

Flow Ozonolysis Using a Semipermeable Teflon AF-2400 Membrane



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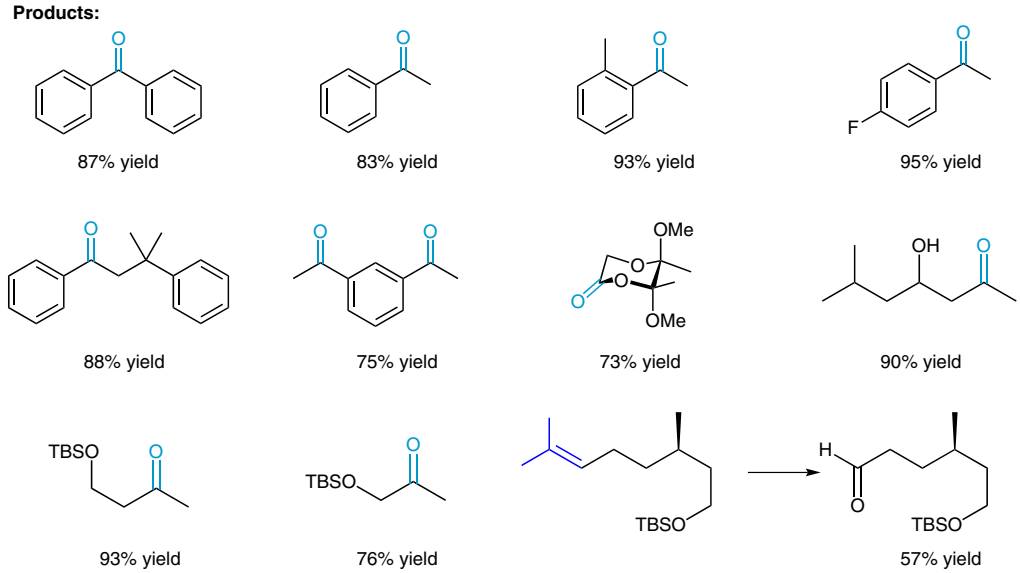

Significance: A simple and convenient flow chemistry device to bring about the ozonolysis of exomethylenes via gas-to-liquid transfer through semipermeable Teflon AF-2400 tubing was developed. Using a Teflon AF-2400 tubing (90 cm length) connected to a syringe pump (Infors AG, HT-Precidor), the flow ozonolysis of a series of exomethylenes was carried out in methanol with one hour of residence time to give the corresponding ketones (10 examples, 73–95% yield). A citronellol derivative (C10-OTBS) was converted into a C7-OTBS aldehyde under similar conditions in 57% yield.

Comment: Gas–liquid contact in a flow chemistry device usually involves the mechanical mixing of two phases. Here, more efficient, controllable, and reliable phase contact was realized using a semipermeable membrane that had high surface areas and selectively allowed O_3 to cross from outside to inside. Telfon AF-2400 consists of an amorphous copolymer of tetrafluoroethylene and a perfluorodimethyldioxolane.

SYNFACTS Contributors: Yasuhiro Uozumi, Yoichi M. A. Yamada, Maki Minakawa
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