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(57) Abstract

A reactor (5, 15, 301) and process for the production of oxirane compounds by reaction of an olefin such as propylene with an organic hydroperoxide using a solid contact catalyst, characterized by the following features: (1) the reactor is divided into a series of separate zones (8, 10, 16, 19, 304, 311), each zone (8, 10, 16, 19, 304, 311) containing a bed of solid epoxidation catalyst; (2) about 25–75 % of the heat of reaction is removed by preheating cold reactor feed by direct contact with a heated recycle stream from the reactor; and (3) about 25–75 % of the heat of reaction is accounted for by a reaction mixture temperature rise of 20–100 °F and by vaporization of 15–40 % of the net reactor product.