

A method for the one-reactor conversion of styrene to cyclic styrene carbonate includes the use of styrene, tert-butyl hydroperoxide and carbon dioxide in the form of carbon dioxide as reagents, water as a solvent, tetrabutylammonium halide as a homogeneous catalyst, a mesoporous material containing titanium cations as a heterogeneous catalyst, and an autoclave as a reactor. Put the styrene, tert-butyl hydroperoxide, water, and the specified catalysts into the autoclave, seal the autoclave, and inject compressed carbon dioxide into the autoclave until an overpressure is created in the autoclave cavity. Heat the reaction mixture in the autoclave. Stir the reaction mixture in the autoclave for the time required to complete the formation of cyclic styrene carbonate. Cool the autoclave, reduce the pressure to atmospheric pressure, remove the contents of the autoclave and separate the cyclic carbonate from it. Additionally, acetonitrile is used as a solvent, and tetrabutylammonium iodide as a homogeneous catalyst, and a hydrotalcite-type material containing magnesium and aluminum cations, water, and carbonate anions in addition to titanium cations, and in which the molar ratio of magnesium(II) aluminum(W): titanium(GU) = 2:1:1.5, and the proportion of titanium cations in the tetrahedral environment is 9.14 %. The said heterogeneous catalyst is activated by heating it and keeping it in a heated state until the physically sorbed water is removed from it, introduce acetonitrile into the autoclave until it is sealed, the said heterogeneous catalyst in a heated state. Compressed carbon dioxide is injected into the autoclave until an overpressure of 2 MPa is created in its cavity. Heat the reaction mixture in the autoclave to a temperature of 100 °C and stir the reaction mixture in the autoclave at this temperature for 22 hours.