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Title: A review of copolymerization of green house gas carbon dioxide and oxiranes to produce polycarbonate

Author/Authors: Ang Rui Ren, Sin Lee Tin, Bee Soo Tueen, Tee Tiam Ting, Abdul Amir Hassan Kadhum, Abdul Razak Rahmat, Bilal A. Wasmi

Abstract: Carbon dioxide is highly stable and low reactivity element which is known to cause greenhouse effect of the Earth. Over the decades, researches have been conducted to utilize abundant carbon dioxide to turn into value added products while reducing its impact to the environment. One of the approaches is reacting carbon dioxide with oxiranes to produce polycarbonate. The low reactivity characteristic of carbon dioxide requires effective and efficient catalysts to make the copolymerization possible. This review highlights the major development in the catalytic copolymerization process of oxiranes and carbon dioxide. Particularly, the important characteristics of zinc, aluminium, chromium, cobalt, cadmium, manganese and rare earth metal with variety of ligands catalysts have been thoroughly discussed. The future research prospects which involve working in the copolymerization area of nanocatalysis and supercritical fluid have been analysed also. In overall, continual exploration of catalysis and reaction package for copolymerization of carbon dioxide is important in order to achieve better improvement of process in future.