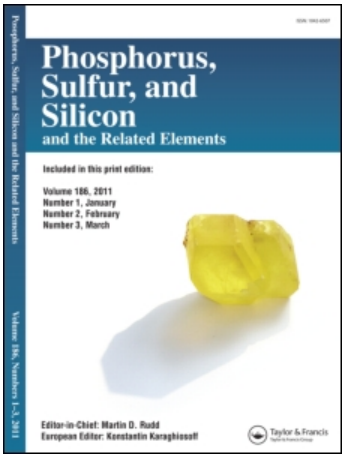

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Condensing Agent Consisting of Trisubstituted Phosphine/Tetrahalomethane/Base System for Direct Polycondensation Using CO 2 as a Monomer

Jun-Ichi Kadokawa[a]; Hideyuki Tagaya[a]
[a] Yamagata University, Japan

Online publication date: 27 October 2010

To cite this Article Kadokawa, Jun-Ichi and Tagaya, Hideyuki(2002) 'Condensing Agent Consisting of Trisubstituted Phosphine/Tetrahalomethane/Base System for Direct Polycondensation Using CO 2 as a Monomer', Phosphorus, Sulfur, and Silicon and the Related Elements, 177: 8, 1925
To link to this Article: DOI: 10.1080/10426500213311
URL: http://dx.doi.org/10.1080/10426500213311

Phosphorus, Sulfur and Silicon, 2002, Vol. 177:1925

1042-6507/02 $12.00 + .00
DOI: 10.1080/10426500290094567

CONDENSING AGENT CONSISTING OF TRISUBSTITUTED PHOSPHINE/TETRAHALOMETHANE/BASE SYSTEM FOR DIRECT POLYCONDENSATION USING CO_2 AS A MONOMER

Jun-Ichi Kadokawa and Hideyuki Tagaya
Yamagata University, Japan

(Received July 29, 2001; accepted December 25, 2001)

Polycarbonate, a fundamental polymer in the field of materials science, is generally prepared by polycondensation of a dihydroxy compound such as bisphenol A with phosgene, a highly toxic agent. The direct synthesis of polycarbonates from CO_2 and diols had not been reported. Recently, we discovered the new polycondensation reaction of CO_2 with *p*- and *m*-xylylene glycols using tributylphosphine/*N*-cyclohexyl-*N*′,*N*′,*N*″,*N*″-tetramethylguanidine (CyTMG) system as the condensing agent, which is the first direct synthesis of polycarbonates from CO_2 and diols.[1] This condensing agent, however, was not effective for the polycondensation of CO_2 with other diol compounds; this is probably due to the lower reactivity of the hydroxy groups compared with the benzylic hydroxy groups of xylylene glycols. Attempts to develop a new condensing agent which is generally applicable to the direct synthesis of polycarbonates from CO_2 and diols, resulted a combination of triphenylphosphine, bromotrichloromethane, and CyTMG. This worked well as the condensing agent for the polycondensation of CO_2 with various diols, giving rise to the corresponding polycarbonates.[2]

REFERENCES

[1] J. Kadokawa et al., *Macromol. Rapid Commun.*, **19,** 657 (1998).
[2] J. Kadokawa et al., *Polym. J.*, **32,** 703 (2000).

Address correspondence to Jun-Ichi Kadokawa, Department of Materials Chemistry, Graduate School of Engineering, Tohoku University, Sendai 980-8579, Japan. E-mail: kadokawa@poly.che.tohoku.ac.jp