CHEMISTRY

UDC 541.6

THE MECHANISM AND KINETIC REGULARITIES OF RECEIVING NEW POLYMERS ON THE BASIS OF N,N-DIALLYLAMINOETHANE ACID

© 2014 г. M.B. Begieva, A.M. Kharaev, Yu.A. Malkanduev, A.K. Mikitaev

Begieva Madina Bilyalovna – Candidate of Chemical Science, Associate Professor, Departament of Organice and Macromolecular Compounds, Kabardino-Balkar State University, Chernishevskiy St., 173, Nalchik, KBR, 360004, Russia, e-mail: madibeg@mail.ru.

Kharaev Arsen Muchamedovich – Doctor of Chemical Science, Professor, Departament of Organice and Macromolecular Compounds, Kabardino-Balkar State University, Chernishevskiy St., 173, Nalchik, KBR, 360004, Russia, e-mail: am_ charaev@ mail.ru.

Malkanduev Yusuf Akhmatovich – Doctor of Chemical Science, Professor, Departament of Organice and Macromolecular Compounds, Kabardino-Balkar State University, Chernishevskiy St., 173, Nalchik, KBR, 360004, Russia, e-mail: malkanduev@mail.ru.

Mikitaev Abdulakh Kasbulatovich – Doctor of Chemical Science, Professor, Head of Departament of Organice and Macromolecular Compounds, Kabardino-Balkar State University, Chernishevskiy St., 173, Nalchik, KBR, 360004, Russia, e-mail:bsk@kbsu.ru

Features and the mechanism of radical polymerization of derivants of N,N-diallyl aminoethane acid in water solutions in the field of small conversion are studied. Influences of unit steps of reaction on polymerization process are defined, numerical values of initiation rate, the relation of the partial constants of growth and break of chains are calculated. Results of research of kinetics of radical polymerization in the described conditions testifies to course in analyzed system analog with acts of degenerate degradation transfer of a chain on monomers of effective transfer of a chain on monomer.

***Keywords**: polymerization, radical polymerization, polymer, N,N-diallyl aminoethane acid monomer, poly-N,N-diallylaminoethane acid, kinetics.*

1. Kabanov V.A., Topchiev D.A. Polimerizaciya ionizuyuschihsya monomerov. M., 1975. S. 224.

2. Topchiev D.A., Malkanduev Yu.A. Kationnye polielektrolity ryada poli-N,N-dialkil-N,N-diallilammoniygalogenidov: osobennosti processov obrazovaniya, svoistva i primeneniya. Nal'chik, 1997. S. 240.

3. Solomon D.H. Cyclopolymerization. I. Structure and Mechanism // J. Macromol. Sci-Chem. A. 1975. Vol. 9, № 1. P. 97 – 113.

4. Ostroverhov V.G., Brunovskaya L.A., Kornienko A.A. O polimerizacii nekotoryh N-diallil'nyh soedineniy. // Vysokomolek. soedineniya. 1964. T. 6, № 5. S. 926 – 928.

5. Matsoyan S.G., Pogosyan G.M., Dzhagamyan A.O., Mushegyan A.A. Issledovanie v oblasti ciklicheskoy polimerizacii i sopolimerizacii. 13. Izuchenie ciklicheskoy polimerizacii N-zameschennyh diallilaminov // Vysokomol. soedineniya. 1963. T. 5, № 6. S. 854 – 860.

6. Matsoyan S.G., Pogosyan G.M., Zhamkochyan G.A. Ciklicheskaya polimerizaciya i sopolimerizaciya. Sintez i izuchenie ciklicheskoy polimerizacii nekotoryh N-zameschennyh proizvodnyh diallil- i dimetilallilamina // Izv. AN. Arm. SSSR. Ser. Him. nauki. 1964. T. 17, № 1. S. 62 – 68.

7. Scherbina F.F., Fedorova I.P., Gorlov Yu.I. Peredacha cepi pri polimerizacii allilamina i ego acilproizvodnyh // Vysokomol. soedineniya. A. 1970. T. 12, № 9. S. 2042–2045.

8. Zubov V.P., Vijaga Kumar M., Masterova M.N., Kabanov V.A. Reactivity of allyl monomers in radical polymerization// J. Macromol. Sci-Chem. A. 1979. Vol. 13, № 1. P. 111 – 131.

9. Murzabekova T.G., Begieva M.B., Malkanduev Yu.A., Topchiev D.A. New ways in synthesis of Macromoleculare cationic Polyelectrolytes based on N,N-Diallylamines // 2nd iupac sponsered international symposium Santa-Margherita ligure, 26–31 may, 1996. Prep. Book. R. 148.

10. Malkanduev Yu.A., Begieva M.B., Butaeva R.J., Murzabekova T.G.,Topchiev D.A. New ways in synthesis of Macromoleculare ationicPolyelectrolytes based on N,N-Diallylamines // 36-th iupac international symposyum on macromolecus. 4–9 August. Seol, 1996.

11. Malkanduev Yu.A., Begieva M.B., Murzabekova T.G., Topchiev D.A. Polimerizaciya monomerov na osnove N-alkil-N,N-diallilaminov // Mendeleevskiy sjezd po obschey i prikladnoy himii : tez. dokl. Kazan', 2003. S. 258.

12. Patent № 2439 086(RF). Zayavka № 2010119316 /04 ot 13.05.2010 g.

13. Patent № 2439 0862012(RF). Zayavka № 2010119316 /04 ot 10.01. 2012 g.

14. Al'mova A.A., Begieva M.B., Haraev A.M., Sivov N.A., Malkanduev Yu.A. N,N-diallilaminoetanovaya kislota i polimery na ee osnove // Izv. vuzov. Sev.-Kavk. region. Estestv. nauki. 2012. № 3. S. 53 – 58.

15. Nazhmetdinova G.T. Osobennosti kinetiki radikal'noy polimerizacii monomerov ryada N,N-dialkil-N,N-diallilammoniy galogenidov : dis. … kand. him. nauk. M., 1983. 189 s.

16. Kanao S., Sakaeri Ya. Yakugaku zasshi // J. Phrmac. Soc. Japan. 1966. Vol. 86, № 11b. R. 1105 – 1108.

17. Topchiev D.A., Malkanduev Yu.A., Korshak Yu.V., Mikitaev A.K., Kabanov V.A. Kinetika radikal'noy polimerizacii N,N-dimetil-N,N-diallil ammoniy hlorida v koncentrirovannyh vodnyh rastvorah // Acta Polymerica. 1985. Vol. 36, № 7. R. 372.

18. Topchiev D.A., Nazhmetdinova G.T., Krapi¬vin A.M., Shreider V.A., Kabanov V.A. O ciklicheskoy strukture po-limera N,N-diallil-N,N-dialkilammoniy hloridov // Vy-sokomol. soedineniya. 1982. A. T. 24 B, № 6. S. 473.

19. Kabanov V.A., Topchiev D.A. Kinetika i mehanizm radikal'noy polimerizacii N,N-dialkil-N,N-diallidammo¬niy galogenidov // Vysokomol. soedineniya. 1988. A. T. 30. S. 675.

20. Timofeeva L.M., Klescheva N.A., Vasilieva Yu.A., Gromova G.L., Timofeeva G.I., Filatova N.A. Mehanizm i kinet-icheskie osobennosti processov polucheniya novyh polimerov na osnove diallilamina // Vysokomol. soedine-niya. A. 2005. T. 47, № 6. S. 916 – 933.

21. Hoover M.F. Cationic Quarternery Polyelectrolytes-A Literature Review // J. Macromol. Sci.-Chem. 1970. A4(6). P. 1293 – 1300.

22. Butler G.B., Bunch R.L. Preparation and polymerization of unsaturated quarternary ammonium compounds // J. Amer. Chem. Soc. 1949. Vol. 71. P. 3020 – 3122.

23. Butler G.B. The Fundamental basis for cyclopolymerization // J. Amer. Chem. Soc. 1967. Vol. 8. P. 35–38.

24. Butler G.B., Raymond M.A. Probability of cyclopolymerization // J. Polym. Sci. A. 1965. Vol. 3, № 10. P. 3413 – 3420.

25. Butler G.B., Kimura S. The Fundamental basis for Cyclopolymerization // J. Macromol. Sci-Chem., A. 1971. Vol. 5, № 1. P. 181 – 209.

26. Butler G.B. Cyclopolymerization // Encyclopedia of Polymer Science and Technology / eds. Mark H.F., Caylord N.G., Bicales N.M. N.Y., 1966. Vol. 4. P. 568 – 598.

27. McCormick C.L., Butler G.B. Anionic Cyclopolymerization // J. Macromol. Sci-Revs., Macromol. Chem., C. 1972. Vol. 8, № 2. P. 201 – 233.

28. Gibbs W.E., Barton J.M. The mechanism of cyclopolymerization of nonconjugated diolefines // Vinil Polymerization / ed. Ham. G.E. 1967. Part 1. Vol. 1. P. 59 – 138.

29. Sorfield G.C., Crawshaw A. Mechanism of cyclopolimerization. Conformational analysis of cis-1,3-diisocyanatocy¬clohexane // J. Polym. Sci., A-1. 1969. Vol. 7, № 4. P. 1179–1185.