

# REFERENCES

1. D C Patra, BPCL "Globalization in Indian Oil Industry- A Case of Rational Choice" Oil Asia Journal, Jan-March'2003; 19-24
2. ONGC Reports; 2004 – 2006
3. IPCL Report; 2005
4. Waples, D.W: (1986) "Geochemistry in petroleum exploration".
5. Dr.A.Nagar, Dr.V.K.Saxena 'Paraffin Deposition Control (Surface/ Downhole) In Kosamba And Nada Oilfield' An Internal Report, RGL,Baroda ONGC,2001
6. Prasad, Dr. Ram,"Petroleum Refining Technology" Delhi Khanna Publisher- 2004
7. Tissot, B.P.; Welte, D.H., "*Petroleum Formation and Occurrence*", 2<sup>nd</sup> ed. Springer Verlag, NY., 1984
8. Speight, J. G., "*Petroleum Chemistry and Refining*", Applied energy technology series, Taylor and Francis, 1996
9. Smirnova, T. Ya., *Thesis*, Alma-Ata, USSR, 1960
10. Speight, J.G. "*The Chemistry and Technology of Petroleum*", 3<sup>rd</sup>. Ed.; Marcel Dekker: New York, 1999
11. Strausz, O.P. in Chapt. 3 of AOSTRA Technical Handbook on Oils Sands, Bitumens and Heavy Oils; Hepler, L.G., Hsui, C., Eds.; AOSTRA: Edmonton, 1989
12. Petroleum Engineering Handbook; Third printing, Feb' 1992 By Howard B. Bradley, Society of petroleum engineers, TX, USA
13. Speight, J. G. "*The Chemistry and Technology of Petroleum*" Marcel-Dekker, New York, 1980
14. Mazee, W. M. "Modern Petroleum Technology", Applied Sciences Pub. Ltd. 4<sup>th</sup> Ed., U. K
15. Stewart. W. T.; Stuart in K. A. Kobbe. Ed., "*Advances in Petroleum Chemistry and Refining*". Vo-II, Interscience Publishers, NY, 1963
16. Wardaugh, L.T., & Boger, D.V. (1988), "Design Procedures for Australian Waxy Crude Oil pipelines" Chemeca 88, (Sydney, 29-31, August), PP 167-171.
17. Speight, J. G., "*Petroleum Chemistry and Refining*", Applied energy technology series, Taylor and Francis, 1998

18. 17625 Guevara, E.; Gonzalez, J.; Nunez, G. "Highly viscous oil transportation methods in the Venezuela oil industry", **1998**, Proceedings of the 15<sup>th</sup> World Petroleum Congress, John Wiley and Sons, London, 495-501
19. Speight, J. G. "*The Chemistry and Technology of Petroleum*", Marcel Dekker, NY, **1980**
20. Hemant P. Soni; D. P. Bharambe; A. Nagar; **Kiranbala**, Synthesis of chemical additives and their effect on Akholjuni crude oil (Gujarat, India), *Indian Journal of Chemical Technology*, Vol. 12, 55-61, **2004**
21. Holder, G.A. and Winkler, J., *Nature*, **1965**, 207, 719
22. 'Petroleum Refining Technology' ; Ram Prasad ; First Addition March' **2000**
23. Abdallah, D. J.; Weiss, R. G. *Langmuir*, **2000**, 16, 352-355
24. Abdallah, D. J.; Sirchio, S. A.; Weiss, R. G. *Langmuir* **2000**, 16, 7558-7561
25. Roscoe; R. in J. J. Hermans ed. "*Flow Properties of disperse Systems*", North-Holland Pub. Co. Amsterdam **1953**
26. Holder G. A., Winkler, J., "Wax crystallization from distillate fuels", *J. Inst.*
27. Turner, W.R., "Normal Alkanes", *IEC Procd. Res. Dev.*, **1971**, 10, (3), pp 238-260
28. *Petroleum*, **965**, 51 (449), 228-252 Keyes, D. B., *Ind. Engg. Chem.*, 24, 1096, **1932**
29. Garcia, M. C.; Carbognani, Urbina, A.; Orea, M. *Pet. Sci. and Technol.*, **1998**
30. Sussman, S., *Ind. Engg. Chem.*, 38, 1228, **1946**
31. *J. Pet. Tech.*, May **1984**, 781-786
32. Buchler, C. C. and Graves, G. D. "The petroleum waxes", *IEC*, **1927**, 19, (6), (June), pp 718-724.
33. Petroleum waxes: Characterization, Performance and Additives STAP No - 2.P.16 Technical Association of the Pulp and Paper Industry, Atlanta, Ga, **1963**.
34. Templin, P. R. "Coefficient of volume expansion for petroleum waxes and pure paraffins", *IEC*, **1956**, (Jan), 48, (1), 154-161
35. Au.J. "Optimize pour point control to save money", *Hydrocarbon processing*, **2001**, 80{1}, 73
36. Misra.S, Baruah S, Singh K, "Paraffin problems in crude oil production and transportation" SPE, 28181, 50-54, **1995**.
37. Chichakli, M. and Jessen, F. W. "Crystal morphology in hydrocarbon systems", *IEC*, **1967** (May), 59, (5), 86-98

38. Negoro, K. "Studies on micro-paraffin (Part 3-6), *Bull. Chem. Soc. Japan*, **1961**, **1962** a, b, 34 (10) pp 1366-1381; 35(3) pp 375-380; 35(6), 916-923
39. Shaw, D. J. "Introduction to Colloid and Surface Chemistry", 2<sup>nd</sup> Edition, Butterworths, London, **1970**.
40. Speight, J. G., Studies on Bitumen Fractionation Information Series No. 84. Alberta Research Council, Edmonton, Alberta, Canada
41. Balta-Cleja, F. J.; Berling, K. D.; Cackovic, H.; Hosemann, R.; Laboda-Cackovic, J. "Diamagnetic susceptibility of solid and liquid paraffins", *J. Macromol. Sci Phys.*, **1976**, *B12* (3), 383-392).
42. Marques, L. C. C.; Machado, A. L. C.; Garcia, R. L. P.; Soldan, A. L.; Campagnolo, E. A. Organic deposition presents challenges in Brazil's offshore fields. *World Oil*, September: 125-133, **1997**.
43. Carnahan, N. F. Paraffin deposition in petroleum production. *J. Pet. Tech.*, **1989**, *41* (10), 1024-1025
44. Reddy & McMillan, "Paraffin Deposition Problems in crude oil production & Transportation" (Feb'1981), 50
45. Meyer, R. F. "World heavy crude oil resources", **1998**, Proceedings of the 15<sup>th</sup> World Petroleum Congress, John Wiley and Sons, London, 459-471.
46. Peyton, K.B., "Fuel Field Manual: Sources and Solution to performance problems", McGraw Hills, **1998**
47. Crandall, G. and Wise, T. "Availability of diluents may inhibit heavy oil exports", *J. Can. Pet. Technol.*, **1984**, July-August
48. Gladyshev, G. P., Turekhanov, T. M., and Smirnova, T. Ya., *Sb. Khim. Tekhnol.*, 5, 183, **1960**.
49. Layrisse, R., "Viscous hydrocarbon-in-water emulsions", *US Patent* 4,795, **1998**, 478.
50. Hamouda, A.A. and Viken, B.K., "Wax deposition mechanism under high pressure and in presence of light hydrocarbons", *Proc. SPE. Int. Symp. on Oilfield Chemistry*, **1993**, New Orleans, 385
51. Tambe, D., Paulis, J.B. and Sharma, M. M. "Factors controlling the stability of colloid-stabilized emulsions, IV. Evaluating the effectiveness of demulsifier", *J. Colloid Interface Sci.*, **1995**, *171*, 456-462.
52. Speight, J. G.; Moschopedis, S. E. "On the molecular nature of petroleum asphaltenes", in Bunger & Li (loc. cit), **1981**.

- 53.** Lundager Madsen H. E.; Boistelle, R. "Calculation of lattice sums and heats of sublimation of long chain even alkanes", *Acta Cryst.* **1976**, A32, 823-831
- 54.** Bunger, J.W., & LI, NC. (Editors), "Chemistry of Asphaltenes", *Adv. Chem. Series 195*, **1981**, (ACS Div. Pet. Chem. 178<sup>th</sup> meet, Washington D.C., Sept. 1979) (Am. Chem. Soc.).
- 55.** Tambe, D.; and Sharma, M. M. "Factors controlling the stability of colloid-stabilized emulsions, III. Measurement of rheological properties of colloid-laden interfaces", *J. Colloid Interface Sci.*, **1995**, 171, 456-462.
- 56.** Speight, J.G.; Moschopedis, S.E., "On the Molecular Nature of Petroleum Asphaltenes", in Chemistry of Asphaltenes, (eds. J.W. Bungm- and N.C. Li), American Chemical Society, Advances in REFERENCES Chemistry Series, 195, 1-15, **1981**.
- 57.** Speight, J. G. "The Structure of Petroleum Asphaltenes: Current Concepts," Information Series 81, Alberta Research Council, Edmonton, **1978**.
- 58.** Traxler, R.N., "Asphalt, its composition, properties and uses", (Reinhold, NY), **1961**.
- 59.** Lichaa P.M., "Asphaltene Deposition Problems in Venezuelan Crudes-Usage of Asphaltenes in Emulsion Stability," **1977**, CIM Conference on the Oil Sands of Canada and Venezuela, 609-624.
- 60.** Koots, J. A.; Speight, J.G. "Relation of Petroleum Resins to Asphaltenes," *Fuel*, **1975**, 54, 179-184.
- 61.** Speight, J.G.; Long R. G.; Trowbridge, T.D. "Factors Influencing the Separation of Asphaltenes from heavy Petroleum Feedstock," *Fuel*, **1984**, 63, 141-146
- 62.** Leontaritis, K. J. ; Mansoori; G. A., "Asphaltene Flocculation During Oil Production and Processing:A Thermodynamic Colloidal Model," **1987** Feb 4-6, SPE paper 16258 presented at the International Symposium on Oilfield Chemistry in San Antonio, Texas.
- 63.** Clarke, E. W. "Crystal types of pure hydrocarbons in the paraffin wax range", *IEC*, **1951** (Nov), 43, (11), 2526-2535.
- 64.** Ferris, S. W. and Cowles, H. C., "Crystal behaviour of paraffin wax", *IEC*, **1945**, (Nov), 21, (11), 1054-1062.
- 65.** Dikie, J., P.; Yen, T.F. "Macrostructures of the asphaltic fractions by various instrumental methods" *Anal. Chem.*, **1967**, 39, 1847.

66. Holder G. A. and Winkler, J. "Wax crystallization from distillate fuels (3 parts)", *J. Inst. Petroleum*, **1965**, *51*, (499), 228-252
67. Wdingarden, J. S. et al, Method for predicting Wax Precipitation and Deposition SPE PE (Feb,1998), 121-126 ,15654
68. Lichaa, P. M. ; Harrera, L. "Electrical and in Other Effects Related to the Formation and Prevention of Asphaltene Deposition" SPE AIME paper 5304 presented at the *International Symposium on oil field Chemistry* in Dallas, **1975**, Jan 16-17, Texas
69. Leontaritis, K.J., "Asphaltene Deposition: A Comprehensive Description of Problem Manifestations and Modeling Approaches," **1989** March 13-14, SPE paper 18892 presented at the SPE Prod. Operations Symposium held in Oklahoma City, OK.
70. Rossemyr, L. I. "Cold flow properties and response to cold flow improver of some typical fuel oils", *IEC Prod. Res. Dev* **1979**, *18*, 3, 227-230.
71. Gandotra, A.K., Panday, A.M., and Koshel, K.C., "Restartability of BHN-URAN oil pipeline" proc. PETROTECH-95,P.1.-5, **1995**.
72. Michael Zettlitzer " Successful field application of chemical flow improvers in pipeline transportation of highly paraffinic crude oil in Kazakhstan" SPE 65168 presented at SPE European Petroleum conference held in Paris,France 24-25 Oct'2000.
73. Gerez; J. M. "Heavy oil transportation by pipeline", International Pipeline Conference, *2*, *ASME*, **1996**.
74. L.T.Wardaugh et al; " Rheology of waxy crude oils" **1990**, SPE Scott Blair, G.W.,Elementary Rheology, Academic Press, NY. 1969.
75. Webber, Richard M. "Low temperature rheology of lubricating mineral oils: Effects of cooling rate and wax crystallization on flow properties of base oils". *J. Rheol.* July/August **1999**, 43-47
76. Silberman T.R. "The flow properties of Difficult to handle Waxy crude" SPE Paper 7409(SPT) **1978**
77. Kitching, S., Johnson, G. D. W., Midmore, B. R.; Herrington, T. M. "Surface Rheological Data for a Polymeric Surfactant using Pulsed Drop Rheometer", *J. Colloid Interface Sci.*, **1996**,*177*, 58-69
78. Baur. W. H and Collins. E. A. in F. R. Eirich, ed. *Rheology*, **1967 Vol-4**, Academic Press, NY

79. Pedersen, Karen, S., "Influence of wax inhibitors on wax appearance temperature, pour point and viscosity of waxy crude oils", *Energy and Fuels*, 2003, 17, 321-328
80. Misra,S,et al " Paraffin Problems in crude oil production & Transportation" Review paper SPE 28181 production & facilities (Feb'1995),50.
81. Groffe D.; Groffe, P.; Takhar, S.; Andersen, S. I.; Stenby E. H.; Lindeloff, N.; Lundgren, M., *Pet. Sci. and Technol.* 2001, 19, 205. (3) 251.
82. Mathur V N; Prasad Jitendra; Singhal H K. Rheology and Transportation of crude oil, 1990, Inst. of Management Development, O.N.G.C., Deharadun
83. J.R.Becker " Paraffin-Crystal modifier studies in field and laboratory" SPE 70030 presented at the SPE Permian basin Oil and Gas recovery conference held in midland Texas, 15-16 may 2001.
84. Rimmer, D., Gregoli, A., Hamshar, J.; Yildivim, E. "Pipeline emulsion transportation for heavy oils", *Emulsions in the Petroleum Industry*, ACS, 1992, 8, 295-312
85. Turner W. R.; Brown D. S.; Harrison D. V. "Properties of paraffin wax- Composition by mass spectrometer analysis", *IEC*, 1955, 47, (6), (June), 1219-1221.
86. Zhang, Fusheng, Wang Biao, 029011, SPE International symposium on Oil Field Chemistry, San Antonio, TX, U.S.A., 14-17 Feb, 1995. Scott Blair, G. W., Elementary Rheology, Academic Press, NY. 1969.
87. Palmer, R.C.; Batchelor, J. "On the crystallization of paraffins from hydrocarbon systems", *Proc. Industr. Cryst. Symp.* 1969, (I. Chem. E. London, 15-16 April).
88. Wang, K. S.; Wu, Creek, C. H.; Shuler, J. L.; P. J., Tang, Y., *Pet. Sci. and Technol.*, 2002
89. "TA Instrumnts, AR 500/1000, Rheometers, Hardware Manual, PN 500017.002 Rev,B(Text only)" Issued January 2000.
90. Altgelt, K. H.; Gouw, T. H. (Editors).*Chromatography in Petroleum Analysis*, Marcel Dekker Inc. NY., 1979
91. Mills, R. Private Communication 1986, (Feb).
92. Tiedje, J. L.; Hollyday W.C. *Petrol. Refin.* 1961, 40 (8), 111.
93. Tanveer S, Sharma.U.C, Prasad R., "Rheology of multigrade engine oils" Ind.Journal.Chem.Technol; 13, 180-184,84, 2006.

94. Wardhangh, L.; Boger, D.; Tomer, S., SPE 17625, Proc. SPE. "Rheology of waxy crude Oils" *Int. Meeting on Pet. Engg.*, Nov 1988, 810-843
95. Rostler, F. S., "Bituminous Materials: Asphalt, Tars and Pitches", Interscience, NY. Vol-II, Part-I, 1965.
96. Ferris, S. W.; Cowles, H. C. "Crystal behaviour of paraffin wax", IEC, 1929, 37, (11), 1054-1062
97. Ferris, S. W. and Cowles, H. C., "Composition and crystal form of the petroleum waxes", IEC, 1931 (June), 23, (6), 681-688.
98. NFunez, G. A., Rivas, H. J.; Joseph, D. "Drive to produce heavy crude prompts variety of transportation methods", *Oil & Gas journal*, 1998, Oct. 26, 59-67.
99. "Synthesis and Evaluation of Polymeric Additives as Flow improvers for Indian crude oil" Hament.P.Soni, Dinaker.P.Bharambe, Indian Polymer Journal. 15(12),2006, 771- 78.
100. L.I. Rossemyr, Ind. Eng. Chem. Prod. Res. Dev. 1979, 18, 227– 230
101. Bos, B.;Van den Haak, K. *Proc. Indonesian Petro Ass.*, 1980 May, 9<sup>th</sup> Annual Convention.
- 102 Liao, K.; Zhai, Y. *Pet. Sci. Techol.*, 1998, 16, pp 971-977.
103. Liao, K. ; Zhai, Y. *Pet. Sci. Techol.*, 1999, 17, pp 51-56.
104. Nozaki, k. and Bartlett, *J. Am. Chem. Soc.*, 68, 168, 1946.
105. Storm, D.A. et al. "Drag Reduction in Heavy Oil", Journal of Energy Resources Technology, 1999, 121, 145-148
106. ASTM D-97,ASTM 5893, ASTM D 36, IP-15
- 107."Synthesis and Evaluation of Polymeric Additives as Flow improvers for Indian crude oil" Hament.P.Soni, Dinaker.P.Bharambe, Indian Polymer Journal.15(12),2006, 771- 78.
108. Chatterjee A.K., Murthy P.S.N. Joshi G.C.,Macromolecules Current trends Vol. I., 3,1995.
109. Dong, L. M.; Xie, S. W. *Acta Petroeli Sinica Chinise* (Petroleum Processing Section) 1996, 12 (4), 66
110. Ghosh, P., Pantar, A.V. and Sarma, A.S.,Indian J.Chem. Technol. Vol.5, 371- 375,1998
111. Smith, B.; Cest, CE. Tuba. "Restart of heavy crude lines probed" *Oil and Gas. J.*, 1979, July 2.
112. Journal of Applied Polymer Science, Vol. 16, pp 849-854, 1972

- 113.** "Pour Point Depressants: A Treatise on Performance and selection ", RohMax Additives GmbH, 1996.
- 114.** J.R.Becker " Paraffin-Crystal modifier studies in field and laboratory" SPE 70030 presented at the SPE Permian basin Oil and Gas recovery conference held in midland,Texas, 15-16 may 2001.
- 115.** S.I.; Flemburg, A.; Kikabhai, T. "Select the optimum pour point depressant" *Hydrocarbon processing*, 1999 Feb., 59-61.
- 116.** Vora, R. A., Bharambe, D. P., "Polymeric Flow Improvers", *Indian Journal of Technology*, 1993 Sept., 31, 633-635
- 117.** El-Gamal, I. M.; Khidr, T. T.; Ghuiha, F. M. *Fuel*, 1998, 77 (5), 375.
- 118.** B.M.Ananda Rao, S.P.Mahajan, & K.C. Khillar, (1985b), "Rheological Characteristics of de-gassed Bombay High crude oil" Indian J.Tech., 23, (Dec), pp 449-450.
- 119.** Doremus, R.H. et al. "Growth and perfection of crystals" NY, Wiley,
- 120.** Baur. W. H and Collins. E. A. in F. R. Eirich, ed. *Rheology*, 1967 Vol-4, Academic Press, NY
- 121.** Gerez, J.M.; Pick, A.R. "Heavy Oil Transportation by Pipeline", *Int. Pipeline Conf.*, 2,699-710, (1996).
- 122.** Frank, F.C, Disc. Faraday Soc. Crystal growth, 1949.
- 123.** Buckley, H.E., *Crystal growth*, NY, Wiley, 1955.
- 124.** Verma, A.R., "Crystal growth and dislocations", NY, Academic Press, 1953.
- 125.** Uhde, A; et at, Pipeline problems resulting from the Handling of Waxy crude". J. Inst.Pet(March 1971), 57; 6373
- 126.** Nagar, A. " Identification of suitable Pour Point Depressant for Jotana, Linch, Sobhasan" ONGC internal report 2004.
- 127.** Knox, J.; Waters, A. B.; Arnold, B. B. Checking Paraffin Deposition by Crystal Growth Inhibition. Presented at the SPE 37<sup>th</sup> Annual Fall Meeting, Los Angeles,Oct. 1962; SPE paper 443.
- 128.** Allen,T " Production Operation, Well completions, Workover and stimulation" Oil & Gas Consultants International (1993)2,1.
- 129.** J Mark, Herman, F., Encyclopedia of Polymer Science and Engineering,Second edition, John-Willey and Sons, N.Y., 1990. Flory, P. J., Principles of polymer chemistry; *Cornell University Press: Ithaca*, New York, 1953.im, Sevet gulf;

130. Chalmers, J.M and Everall, N.J." Ploymer characterization" (B.J.Haut. and M.I.James eds.) Chap 4, Blackie Academic and professional, NY,
131. Uhde, A; et at, Pipeline problems resulting from the Handling of Waxy crude". *J.Inst.Pet*(March 1971), 57; 6373
132. P. E. Ford, J. W. Ellis; R. J. Russel, "Pipelining high pour point crude", *Oil & Gas*, 1965
133. Holder G. A., Winkler, J., "Wax crystallization from distillate fuels", *J. Inst. Petroleum*, 965, 51 (449), 228-252.
134. Garcia, M. C.; Carbognani, Urbina, A.; Orea, M. *Pet. Sci. and Technol.*, 1998, 16,1001
135. Biao, W et al, "Paraffin characteristics of waxy crude oils in China and the method Of paraffin removal and inhibition" paper SPE 29954 presented at 1995 SPE international Meeting on Petroleum Engineering, Beijing, PR China, Nov,14-17
136. Woo, G.T., Garbis, S.J., and Gray, T.C. " Long term control of paraffin deposition" SPE 13126., presented at 59<sup>th</sup> conference, Houston, Texas, 1984.
137. Pedersen, Karen, S., "Influence of wax inhibitors on wax appearance temperature, pour point and viscosity of waxy crude oils", *Energy and Fuels*, 2003, 17, 321-328.
138. Becker, J.R., Paraffin-Crystal Modifier Studies in Field and Laboratory, SPE Paper 70030 (May 2001).
139. Several ASTM Procedures are reported Such as: ASTM D-287, ASTM D-1298, ASTM D-941, ASTM D-1217, and ASTM D-1555. ASTM D -2549
140. The determination of aromatic content of Olefin-free gasoline by Silica gel absorption: ASTM D-936.
141. Petroleum Waxes, "Kirk-Othmer Encyclopedia of Chemical Technology, 3<sup>rd</sup> Editive John Wiley & Sons Inc. 1984
142. Botros, M. G., "Cold flow improvers for distillate fuel compositions", *US Pat. 6,203,583*, 2001 March 20.
143. Peyton, K. M., Wang, S. L., "Composition and method for lubricant wax dispersant And pour point improver", *US Pat. 6,174,843*, 2001 Jan. 16
144. D.C.Thomas; "Selection of paraffin control Products & Application" SPE Nov. 1988, 4

- 145.** The determination of hydrocarbon types in liquid Petroleum: ASTM D-1319, ASTM D-86, ASTM D-216, ASTM D-285. ASTM D-97, ASTM-D95. ASTM D 445-1
- 146.** Argillier, J.F.; Barre, L.; Brucy, F.; Dournaux, J.L.; Hénaut, I.; Bouchard, R. n “Influence of Asphaltenes Content and Dilution on Heavy Oil Rheology”, *SPE Proceedings*, 2001, 69711
- 147.** Ludwig, F. J., *Anal. Chern.*, Dec 1965, 37, 1732.
- 148.** Macosko. C. W. in R. J. Goldstein Ed., “*Fluid Mechanics Measurements*”, Hemisphere Pub. Co. NY. 1983.
- 149.** Collins E. A., Chen. C. H., *J. Rhea/.*, 1988, 32,163.
- 150.** Papanastasiou. T. C., *J. Rhea/.*, 1987, 31, 385.
- 151.** Eley. R. in J. Koleske ed., Paint Testing Manual: Gardner Swar Handbook, 14<sup>th</sup> Ed., ASTM Philadelphia, 1995.
- 152.** Song Yuping; Ren Tianhui; Xisheng Fu; Xiaohong Xu. Study on relationship Between the structure and activities of alkyl methacrylates-maleic anhydride polymers as cold flow improvers in diesel fuels. *Fuel Processing Technology*, 2004
- 153.** “Paraffin problems can be resolved with Chemicals” Oil & Gas Journal Feb 27 1984, 79-82.
- 154.** Vogel’s Text-book of Practical organic chemistry, V<sup>th</sup> Edition, Longman,1994.
- 155.** Hsu,S.L “Comprehensive Polymer Science: The synthesis, characterization,reaction and application of polymers” Vol.1 Chap.20. pergammon press, NY, 1989
- 156.** Walling, C. In free radicals solution; *Wiley: New York*, 592, 1957.
- 157.** Shahani, C. J. and N. Indictor, *J. Polym. Sci. Polym. Chem. Ed.* 16, 2683, 2997, 1978.
- 158.** Walling, C. J., *J. Polym. Sci.*, 14, 214, 1954.
- 159.** Baldwin, M. G., *J. Polym. Sci.*, A3, 703, 1965.
- 160.** Kirk- Othmer., Encyclopedia of chemical technology, Fourth edition, John-Willey and Sons, NY 1992.
- 161.** Cohen, H.L, J .Poly. Sci., Poly. Chem. Ed. 14, P.7-22
- 162.** Yoshimura, M., H., Mikawa and Y. Shirota, *Macromolecules*, 11, 1085, 1978.
- 163.** *Polymer Letters*, Vol. 10, pp 95, 1972

- 164.** Reid, E. E., "Esterification" in Ed.: Groggins, P., *Unit process in organic synthesis*, 4<sup>th</sup> Ed., Mc Graw Hill Book Co., NY, **1952**
- 165.** Gladyshev, G. P. and Gibov, K. M., *Polymerization at advanced degree of conversion*, 1<sup>st</sup> Ed., Israel Programme for Scientific Translation, Jerusalem, **1970**.
- 166.** Field, N. D. and Lorenz, J.H., "Vinyl ethers" in *Vinyl and Diene Monomers*, Ed. Leonard E.C., J. Willey, N.Y. **1970**.
- 167.** Saratovkin, D.O., "Dendritic Crystallization" Russ. Trans. Consultants Burean Inc. **1959**.
- 168.** Overberger, C. G., Ed., *Macromolecular Synthesis*, John Willy and Sons, N.Y., pp 42. **1963**.
- 169.** Chiang, T. C., Ch. Graillat, J. Guillot, Q. T. Pham, and A. Guyot, *J. Polym. Sci. Polym. Chem. Ed.*, 15, 2961, **1977**.
- 170.** Ferraro, J.R and L.J.Basile.eds. "Fourier Transform Infrared Spectroscopy" Academic press. NY, **1978**.
- 171.** Silverstein, R.M, Bassler, G.C and Morrill, T.C "Spectroscopic identification of Organic compounds" 3<sup>rd</sup> ed. Wiley, NY, **1978**
- 172.** Dyer J.R., Application of Absorption spectroscopy of organic compounds, P-33-38, Prentice- Hall of India, New Delhi, **1994**
- 173.** Wang Zhogming, Practical Infrared Spectroscopy, Press of Petroleum and Industry, 1978
- 174.** GP. 2,050,071, Apr.1971; CA: 75: 997484, **1971**.
- 175.** Botros, M. G., U. S. Patent 5,681,359, October 28, **1997**.
- 176.** Wisotsky, M. J.; Miller, H. N., U.S. Patent 3,638,349, Feb1, **1972**.
- 177.** HInycky, S. ; Charles, B., U. S. Patent 3,048,479, **1962**, August 7.