

# The Role Of Allylanisole In Metallocene-Catalyzed Propylene Polymerization And Synthesis Of End-Capped Oligomers

Atiqullah, M; Akhtar, MN; Tinkl, M; Ahmed, N

WILEY-VCH VERLAG GMBH, MACROMOLECULAR REACTION ENGINEERING;

pp: 334-338; Vol: 2

King Fahd University of Petroleum & Minerals

<http://www.kfupm.edu.sa>

## Summary

Propylene was copolymerized with allylanisole (AA) using  $\text{Me}_2\text{Si}(\text{Ind})_2\text{ZrCl}_2$  and  $\text{Et}(\text{Ind})_2\text{ZrCl}_2$ , and the methylaluminoxane MAO cocatalyst at 70 degrees C and a cocatalyst to catalyst (Al:Zr) molar ratio of 1000. It was fed at 8.5 bar(g). The weight-average molecular weight,  $(M)_w$ , for both metallocenes decreased as the AA feed concentration increased. Therefore, allylanisole acted as an in situ chain transfer agent. The chain transfer constants,  $k(\text{tr})/k(\text{P})$ , of AA for  $\text{Et}(\text{Ind})_2\text{ZrCl}_2$  and  $\text{Me}_2\text{Si}(\text{Ind})_2\text{ZrCl}_2$  turned out to be 0.33 and 0.40, respectively. The characterization of the resulting products by (HNMR)-H-1 demonstrated that AA end-capped the isotactic poly(propylene) chains which showed to be low molecular weight oligomers;  $4.96 \times 10^3 \leq (M)_w \leq 9.80 \times 10^3$ . An appropriate chain transfer mechanism for AA has been proposed.

## References:

1. ATIQUZZAH M, 1998, EUR POLYM J, V34, P1511
2. ATIQUZZAH M, 2006, SURF INTERFACE ANAL, V38, P1319, DOI 10.1002/sia.2452
3. ATIQUZZAH M, 2007, APPL CATAL A-GEN, V320, P134, DOI 10.1016/j.apcata.2007.01.023
4. BOFFA LS, 2000, CHEM REV, V100, P1479
5. BOWDEN NB, 2002, MACROMOLECULES, V35, P9246, DOI 10.1021/ma020544g
6. CASTONGUAY LA, 1992, J AM CHEM SOC, V114, P5832
7. CHUNG TC, 2001, J AM CHEM SOC, V123, P4871
8. CHUNG TC, 2001, MACROMOLECULES, V34, P8040
9. CHUNG TC, 2002, PROG POLYM SCI, V27, P39

11. DONG JY, 2002, MACROMOLECULES, V35, P9352, DOI 10.1021/ma0211582
12. FU PF, 1995, J AM CHEM SOC, V117, P10747
13. GUPTA VK, 1994, J MACROMOL SCI REV C, V34, P439
14. ITTEL SD, 2000, CHEM REV, V100, P1169
15. KAWAOKA AM, 2004, J AM CHEM SOC, V126, P12764, DOI 10.1021/ja045965n
16. KAWAOKA AM, 2005, J AM CHEM SOC, V127, P6311, DOI 10.1021/ja0441741
17. KISSIN YV, 1985, ISOSPECIFIC POLYM OL, CH1
18. KOO K, 1999, J AM CHEM SOC, V121, P8791
19. KOO K, 1999, MACROMOLECULES, V32, P981
20. KULIN LI, 1988, PURE APPL CHEM, V60, P1403
21. RESCONI L, 1992, J AM CHEM SOC, V114, P1025
22. SPALECK W, 1994, ORGANOMETALLICS, V13, P954
23. TAIT PJT, 1989, COMPREHENSIVE POLYM, V4, P549
24. XU GX, 1999, J AM CHEM SOC, V121, P6763

For pre-prints please write to: [matiq@kfupm.edu.sa](mailto:matiq@kfupm.edu.sa)