Ethene oligomerization using iron(III) complexes bearing an anionic N,N,N ligand
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Abstract

Various iron(III) complexes bearing an anionic N,N,N ligands (L = 2-Methyl-2,4-bis(pyridin-2-yl)-1,2-R-1,10-phenanthroline with R= H, OMe, Br and Ph) have been synthesized and had their activities for ethene oligomerization examined. A study regarding the effect of ligand composition and the environmental reaction conditions on this ethene oligomerization was performed. The bromine bearing catalytic complex proved to yield no oligomerization products, whereby the other complexes are in fact active in the ethene oligomerization reaction. The selectivity towards light linear 1,2-olefins increased with higher electronic donating properties of the functional ligand group. A reverse effect was observed regarding the catalytic activity. Applying a larger ethene pressure resulted in higher activity with no change to the product length while increasing the temperature caused the activity to drop but increasing selectivity towards short olefin formation. Finally the effect of the MMAO aluminum activator was examined which increased the selectivity towards light olefins due to faster termination via chain transfer to the aluminum activator, no change in catalytic activity was observed.