growth α was then calculated according to the formula:

$$\alpha_n = \frac{F_{n+1}}{F_n}$$

where F is the number fraction. The variation of α with carbon number obtained with both reactors is illustrated in Fig. 7. The fixed bed sample α was virtually constant and had a value of approximately 0.969. In contrast the Berty sample had an α value which increased from 0.943 to a steady value of 0.969 at a carbon number of approximately 40. The dependence of α upon a reactor type has previously been predicted in the literature (15). One conclusion that can be drawn from these calculations is that on using a similar catalyst a fixed bed reactor will tend to produce more and harder wax than that obtained with a Berty reactor under similar conditions.

The Future Prospects

The worldwide introduction of the Fischer-Tropsch process will primarily depend upon the availability of oil and on its cost. The use of ruthenium in the process will depend upon the availability of low ruthenium loading catalysts with good activity and selectivity compared with the presently used iron-based systems. We have successfully demonstrated that a low metal loading catalyst can be very active and also have good selectivity. In addition the catalyst was durable enough to survive on an extended laboratory durability trial with little loss of performance. It is our belief that the use of new ruthenium catalyst systems as indicated in this article represents a substantial improvement on previously available ruthenium catalysts, and will achieve significant utilisation in commercial operations to produce premium products such as jet and diesel fuel and wax.

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