Critical Constants of Two Isomers of Triacontane: n-Triacontane and Squalane

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Both n-triacontane and squalane are thermally unstable compounds. In the last years, the critical properties of squalane were the subject of several computer simulations [1-4]; they were also measured using a flow technique [5]. However, the results of simulations and the measurement differ considerably from one another. We made measurements of the critical temperature and pressure of squalane by the pulse-heating method with ultralow residence times [6]. The critical constants of n-triacontane were also measured by us earlier using the same method [7]. Both the critical temperature and the critical pressure measured by us exceed those determined by the flow method. We explain this discrepancy by the further decomposition of squalane in the flow experiments compared to ours, because in the flow method the residence time is about 0.1 s for full heat up from the ambient temperature, whereas in the pulse-heating experiments this value is from 0.03 to 1.0 ms. Low molar mass alkanes with a few branches are well known to have lower critical temperatures and higher critical pressures than linear isomers. According to our measurements the critical properties of squalane and n-triacontane are equal to, respectively: 822 K, 0.700 MPa and 843 K, 0.636 MPa. Therefore, the tendency mentioned above is also true for high-molar-mass alkanes.

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