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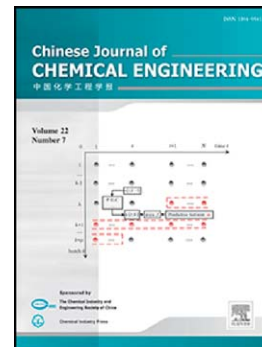
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# Flow-resistance Analysis of Nano-confined Fluids Inspired from Liquid Nano-lubrication: A Review\*

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**Abstract** How to reduce flow resistance of nano-confined fluids to achieve a high flux is a new challenge for modern chemical engineering applications, such as membrane separation and nanofluidic devices. Traditional models are inapplicable to explain the significant differences in the flow resistance of different liquid-solid systems. On the other hand, friction reduction in liquid nano-lubrication has received considerable attention during the past decades. Both fields are exposed to a common scientific issue regarding friction reduction during liquid-solid relative motion at nanoscale. A promising approach to control the flow resistance of nano-confined fluids is to reference the factors affecting liquid nano-lubrication. In this review, two concepts of the friction coefficient derived from fluid flow and tribology were discussed to reveal their intrinsic relations. Recent progress on low or ultra-low friction coefficients in liquid nano-lubrication was summarized based on two situations. Finally, a new strategy was introduced to study the friction coefficient based on analyzing the intermolecular interactions through atomic force microscope (AFM), which is a cutting-point to build a new model to study flow-resistance at nanoscale.

**Keywords** flow resistance, membrane separation, liquid nano-lubrication, model, intermolecular interactions, AFM

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