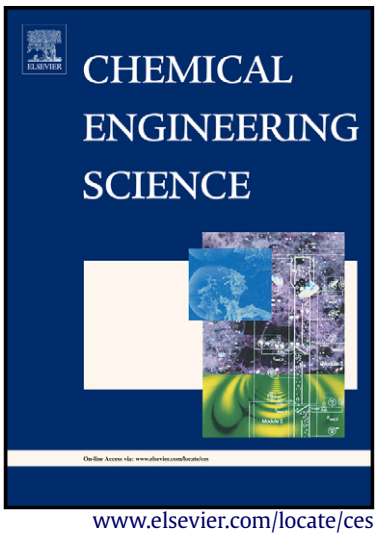


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# Understanding the capillary behavior using the extended reduced similar geometry method

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**Abstract**

Pore scale modeling is used to understand the transport phenomena in porous media. Capillary behavior is an important property in pore scale research. We extend the reduced similar geometry (RSG) method to tangential polygons and simplify the results to concise equations. Based on the RSG method results, the effects of the shape similarity, the shape factor and the contact angle on the capillary behavior are investigated. A new and more accurate parameter is proposed to predict the threshold radius during primary drainage. This parameter is demonstrated to predict the threshold radius accurately for arbitrary polygon shapes and real rock shapes. It also performs better than the traditional predictor when predicting the capillary behavior for concave shapes.
**Keywords:** pore scale modeling, capillary behavior, RSG method, threshold radius

## 1. Introduction

The phenomena of flow through porous media are ubiquitous in natural and artificial materials. Some examples include groundwater flow, underground oil flow, the microcirculation of blood in animals, the translocation of water in plants, and gas migration in a packed bed. Usually, the flow