

Flow regimes and pressure drop of a composite tridimensional rotational flow sieve tray under concurrent gas–liquid flow

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Abstract

A new type of composite tridimensional rotational flow sieve tray is proposed. The flow pattern and operation domain of the tray were defined and divided by the image shooting method, combined with the standard deviation of the pressure difference sequence. There are membrane–drip column and foam–embolic flow in the TRST area of the internal packing–type tray, while bubbly and milk froth–ribbon flow are present in the packing area of the external packing–type tray. This study focused on the influence of the tray structure parameters on the pressure drop. Under the experimental operating conditions, the dry pressure drop was within 160 Pa, while the wet pressure drop was within 900 Pa. Under the same structural parameters, the internal packing–type pressure drop of the tray was higher than that of the external packing–type tray. A mathematical model of the pressure drop between dry and wet trays was established.

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