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Global Optimization of Multicomponent Distillation Configuration

A Branch and Bound global optimization technique is introduced for multicomponent crude oil distillation to improve efficiency and limit waste.

Despite the growth of renewable alternative energy sources, oil is still the predominant energy source due to the large reliance on the product on a day to day basis. For example, the United States alone uses 19.4 million barrels of oil per day according to the Energy Information Administration. In order to provide this large amount of oil, crude oil must first be distilled. Current processes are imperfect in nature, resulting in an overconsumption of energy.

Researchers at Purdue University have invented a technique of optimizing multicomponent crude oil distillation to limit waste and improve efficiency. In showing that a general, analytical method of optimization does not necessarily work for all types of component combinations, a Branch and Bound technique was introduced that can be used as a global optimization tool. This will allow for more efficient oil distillation and less guess work done by engineers.

Advantages:

-Can solve more problems than analytical methods

-Allows for efficient optimization in many distillation systems

Potential Applications:

-Crude oil distillation

TRL: 6

Intellectual Property:

Technology ID
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Category
GreenTech/Carbon Management
Robotics & Automation/Automation & Control

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