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(54) **Title:** METHOD, APPARATUS AND SYSTEM FOR WHOLE-PROCESS OPTIMIZATION OF MOLECULAR-LEVEL OIL REFINERY PROCESSING, AND STORAGE MEDIUM

(54) 发明名称: 一种分子级炼油加工全流程优化方法、装置、系统及存储介质

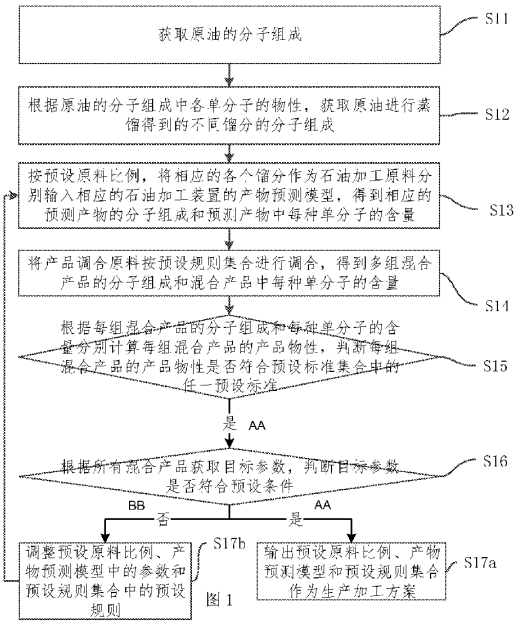

图 1

S11 Acquire the molecular composition of crude oil
S12 Acquire, according to the physical properties of various single molecules in the molecular composition of the crude oil, the molecular composition of different fractions obtained by means of the distillation of the crude oil
S13 Input, according to preset raw material proportions, corresponding various fractions as raw materials for petroleum processing into a product prediction model of corresponding petroleum processing apparatuses respectively, so as to obtain the molecular composition of corresponding predicted products and the amount of each single molecule in the predicted products
S14 Blend product blending raw materials according to a preset rule set, to obtain the molecular composition of multiple groups of mixed products and the amount of each single molecule in the mixed products
S15 Calculate the physical properties of each group of mixed products according to the molecular composition of each group of mixed products and the amount of each single molecule, and determine whether the physical properties of each group of mixed products meet any preset standard in a preset standard set
S16 Acquire target parameters from all the mixed products, and determine whether the target parameters meet preset conditions
S17a Output the preset raw material proportions, product prediction model and preset rule set as a production and processing scheme
S17b Adjust the preset raw material proportions, parameters in the product prediction model and preset rules in the preset rule set
AA Yes
BB No

(57) **Abstract:** A method, an apparatus and a system for the whole-process optimization of molecular-level oil refinery processing, and a storage medium. According to an embodiment of the present invention, for mixed products obtained by means of prediction from the simulation of a molecular-level crude oil processing process, when the physical properties of any mixed product do not meet any preset standard, or target parameters of the mixed products do not meet preset conditions, the proportions of different fractions introduced into

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respective petroleum processing apparatuses are adjusted, operating parameters in a product prediction model are adjusted, and mixing rules for mixing predicted products are adjusted, so as to obtain mixed products anew until the physical properties of all the mixed products meet any preset standard, and the target parameters of all the mixed products meet the preset conditions; and final predicted products are predicted by adjusting the proportions of the fractions for secondary processing. The production efficiency is improved by means of the simulation optimization of a production process.

(57) 摘要：本发明涉及一种分子级炼油加工全流程优化方法、装置、系统及存储介质。本发明实施例从分子级原油加工流程模拟预测得到的混合产品，当任一混合产品的产品物性不符合任一预设标准，或者，混合产品的目标参数未符合预设条件，调整不同馏分进入相应石油加工装置的比例，调整产物预测模型中的操作参数，调整预测产物进行混合的混合规则，重新得到混合产品，直至所有混合产品的产品物性符合任一预设标准，且所有混合产品的目标参数符合预设条件，通过调整馏分进行二次处理的比例，预测最终的预测产物，通过对生产工艺进行仿真优化，提高生产效益。