



Distillate Oil Combined Hydrogenation Method and Distillate Oil Combined Hydrogenation Apparatus

The present invention discloses a distillate oil combined hydrogenation method and a distillate oil combined hydrogenation apparatus. The distillate oil feedstocks are divided by sulfur content into high-sulfur distillate oil feedstocks and low-sulfur distillate oil feedstocks, the high-sulfur distillate oil feedstocks are processed with conventional gas-phase circulating hydrogenation technique, the material processed with conventional gas-phase circulating hydrogenation technique is cooled down and flows into a high-pressure separator, the gas phase separated in the high-pressure separator enters into the circulating hydrogen system and is cycled and reused, and the liquid phase separated in the high-pressure separator enters into a two-phase hydrogenation apparatus; a circulating oil system is canceled in the two-phase hydrogenation apparatus, the low-sulfur distillate oil feedstocks undergo a hydrogen dissolving procedure and then is mixed with the liquid phase material discharged from the high-pressure separator described in step a) and the mixed material enters into a two-phase hydrogenation reactor, the hydrogenated distillate oil product is recovered from the effluent of the two-phase hydrogenation reactor. The present invention combines seamlessly the conventional hydrogenation process with a two-phase hydrogenation process. The method provided in the present invention can be used to process different feedstocks using the advantages of the conventional gas-phase circulating hydrogenation technique and the two-phase hydrogenation technique respectively, and can achieve combined processing effects.

Figure 1

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