

[ABSTRACT]

[PROBLEM] In a gasification apparatus that heats and pressurizes a gasification feedstock to bring the gasification feedstock into a fluid in a supercritical state and performs decomposition-treatment on the gasification feedstock to obtain fuel gas, energy possessed by the treated fluid can be effectively utilized.

[SOLUTION] A gasification apparatus configured to heat and pressurize a gasification feedstock to bring the gasification feedstock into a supercritical state, and perform decomposition-treatment on the gasification feedstock to obtain fuel gas, the gasification apparatus including: a heat exchanger 31 configured to introduce the gasification feedstock into a low-temperature-side flow channel 31a and introduce treated fluid in a supercritical state into a high-temperature-side flow channel 31b, so that heat exchange is performed between the gasification feedstock and the treated fluid; a gas-liquid separator 51 configured to extract, from the high-temperature-side flow channel 31b, the treated fluid that has been in a subcritical state due to heat exchange, perform gas-liquid separation on the treated fluid, and return a separated liquid to the high-temperature-side flow channel 31b; and a synthesis device 52 configured to synthesize a liquid fuel from fuel gas separated by the gas-liquid separator 51.