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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0230810 A1**
(31) **SUEDA et al.** (43) **Pub. Date: Jul. 20, 2023**(54) **PLASMA PROCESSING GAS, PLASMA
PROCESSING METHOD, AND PLASMA
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ABSTRACT

A plasma processing apparatus **100**, which has an impact on global warming and allows for high-throughput plasma processing, includes a chamber **1** in which plasma is generated, a mounting table **2** disposed in the chamber, wherein a substrate **S** is mounted on the mounting table **2**, and a gas supply source **3** (**3a** to **3d**) for supplying gas for generating plasma in the chamber, wherein the substrate is subjected to deep etching by executing alternately and repeatedly an etching process **S2** of etching the substrate by using plasma and a protective film deposition process **S3** of depositing a protective film in a recess formed through the etching process by using plasma. It is characterized in that, in the protective film deposition process **S3**, a mixed gas of C_4F_8 and 2,3,3,3-tetrafluoropropene is supplied from the gas supply sources **3b**, **3c** into the chamber as gas supplied for generating plasma.

