CLAIMS

[Claim 1]

A shock wave generation system comprising:

a combustion device having a gas passage through which combustion gas flows from a base end to a front end, the front end having an opening;

a combustible gas supply device configured to supply a combustible gas from the base end to inside of the combustion device;

an ignition device configured to ignite the combustible gas supplied to the combustion device;

a flame occurrence timing detection sensor configured to detect timing of occurrence of flame caused by combustion of the combustible gas; and

a determination device configured to determine spontaneous ignition of the combustible gas before ignition by the ignition device, based on a detection result from the flame occurrence timing detection sensor, the determination device being further configured to determine detonation and deflagration, wherein

the determination device determines detonation and deflagration based on a propagation speed of flame detected by the flame occurrence timing detection sensor, and

when the determination device determines detonation, an intensity of a detonation wave is estimated using a threshold obtained based on the propagation speed of flame and using a pulse length that is a time length during which flame occurs from time of flame occurrence to time of flame extinction detected by the flame occurrence timing detection sensor.

[Claim 2]

The shock wave generation system according to claim 1, wherein the flame occurrence timing detection sensor is an optical sensor configured to detect light emission from the flame.

[Claim 3]

The shock wave generation system according to claim 1, wherein

the combustion device includes:

a detonator having a base end connected to the combustible gas supply device;

and

a combustor having a base end connected to a front end of the detonator, and

the flame occurrence timing detection sensor is disposed to face toward the opening of the combustor.

[Claim 4]

The shock wave generation system according to claim 1, wherein

the combustion device includes:

a detonator having a base end connected to the combustible gas supply device; and

a combustor having a base end connected to a front end of the detonator, and

a plurality of the flame occurrence timing detection sensors are disposed at a distance from each other in a direction of gas flow in the combustor.

[Claim 5]

The shock wave generation system according to claim 1, wherein when the determination device determines spontaneous ignition of the combustible gas, the combustible gas supply device stops supply of the combustible gas.

[Claim 6]

The shock wave generation system according to claim 5, wherein when the determination device determines spontaneous ignition of the combustible gas, a purge gas is supplied to the inside of the combustion device.