CLAIMS

1. A device for performing PCR comprising;

a sample container for holding a PCR sample, wherein the sample container comprises

a target nucleic acid,

dNTPs,

a polymerase provided at a concentration of at least 0.5 µM, and

a pair of primers configured for amplifying the target nucleic acid, wherein the primers are each provided at a concentration of at least 2 µM;

means for heating the sample;

means for cooling the sample; and

control means for repeatedly subjecting the sample container to the means for heating the sample and the means for cooling the sample to thermal cycle the sample at a ramp rate of at least 200°C/s.

2. The device of claim 1, further comprising means for optically exciting the sample in a monitoring position to cause the sample to fluoresce; and means for detecting the fluorescence of the excited sample during amplification.

3. The device of claim 2, wherein the ramp rate is at least 300°C/s.

4. The device of claim 3, wherein the ramp rate is at least 400°C/s.

5. The device of claim 1, wherein the means for heating is a hot water bath and the means for cooling is a cool water bath.

6. The device of claim 1, wherein the device is a microfluidics system.

7. A device for performing PCR comprising;

a sample container for holding a PCR sample, wherein the sample container comprises

a target nucleic acid,

dNTPs,

a polymerase provided at a concentration of at least 0.5 µM, and

a pair of primers configured for amplifying the target nucleic acid, wherein the primers are each provided at a concentration of at least 2 µM;

a heat transfer device for changing temperature of the sample in the sample container; and

a temperature controller for controlling the heat transfer device to repeatedly heat and cool the sample at a ramp rate of at least 200°C/s.

8. The device of claim 7, wherein

the heat transfer device comprises a plurality of water baths, and