CLAIMS

1. Method for monitoring a heat treatment applied to a substrate comprising a weakened zone formed by implanting atomic species, the substrate (S) being arranged in a heating chamber (11), characterized in that it comprises

- splitting of the substrate along the weakened zone,
- recording sound in the interior or in the vicinity of the heating chamber (11),
- detecting, in said recording, a sound emitted by the substrate during the splitting thereof along the weakened zone, and
- based on said detected sound, determining that splitting of the substrate along the weakened zone has occurred.

2. Method according to claim 1, wherein said recording is made with a microphone (3) arranged in the interior of the heating chamber (11).

3. Method according to claim 1, wherein said recording is made with a microphone (3) arranged on an exterior wall of an annealing furnace (1) containing said heating chamber (11).

4. Method according to claim 1, wherein said recording is made with a microphone (3) arranged between a thermal screen (13) and a door (12) of an annealing furnace (1) allowing access to the heating chamber (11).

5. Method according to claim 1, wherein said recording is made with a microphone (3) arranged in a tube (30) that opens onto the interior of the heating chamber (11).

6. Method according to one of claims 1 to 5, further comprising, from the recording of the sound in the interior or in the vicinity of the heating chamber (11), detecting a breakage of the substrate.

7. Method according to one of claims 1 to 6, wherein a batch of substrates to be split is loaded into the heating chamber, said method comprising detecting, in the audio recording, the sound emitted by each substrate during the splitting thereof.

8. Method according to claim 7, comprising recording sound in the interior or in the vicinity of the heating chamber (11) by means of two microphones (3) that are located at distance from each other, and, on the basis of a time shift between the sounds of the splitting

of a substrate detected in the recording of each of said microphones, locating within the batch the substrate for which splitting has occurred.

9. Method according to claim 8, wherein the microphones (3) are arranged in opposite regions of the heating chamber (11).

10. Method according to one of claims 7 to 9, wherein the heat treatment is stopped once each substrate has been detected to have split.

11. Method according to one of claims 7 to 9, wherein, after a preset length of time, the number of substrates detected to have split is lower than the number of substrates, and the batch is unloaded with a view to separating the split substrates manually.

12. Method according to one of claims 1 to 11, wherein a vibration frequency of a substrate during splitting is determined from a maximum frequency of the sound generated by the splitting of the substrate, and a splitting speed of the substrate is determined from said vibration frequency.

13. Method according to one of claims 1 to 12, wherein an energy released during the splitting of a substrate is determined from the intensity of the sound generated by said splitting.

14. Method according to one of claims 1 to 13, wherein the speed of a splitting wave propagating through a substrate is determined from the maximum frequency corresponding to the peak sound intensity.

15. Method according to one of claims 1 to 14, wherein each substrate comprises at least one semiconductor material.

16. Device for the heat treatment of a batch of substrates each comprising a weakened zone formed by implanting atomic species with a view to splitting said substrate along said weakened zone, comprising an annealing furnace (1) comprising a heating chamber (11) configured to simultaneously receive the whole of said batch, at least one microphone (3) configured to record sounds in the interior or in the vicinity of the heating chamber, and a processing system (4) configured to detect, in an audio recording produced by said microphone, a sound emitted when a substrate splits along the weakened zone and to determine that splitting of each substrate along the weakened zone has occurred based on the detected sound.

17. Device according to claim 16, wherein the microphone (3) is arranged in a tube (30) that opens onto the interior of the heating chamber (11).

18. Device according to either of claims 16 and 17, comprising at least two microphones (3) that are located at distance from one another.

19. Device according to claim 18, wherein the processing system (4) is configured, on the basis of a time shift between the sounds of the splitting of a substrate detected in the recording of each of said microphones, to locate within the batch the substrate for which splitting has occurred.

20. Device according to one of claims 16 to 19, further comprising a system for controlling the furnace, configured to stop the heat treatment once all the substrates of the batch have been detected to have split.