Claims

1. A handheld instrument for x-ray fluorescence analysis comprising

- a housing (29),

- an x-ray fluorescence measurement device arranged in the housing (29), the measurement device comprising a radiation source, by which a primary beam is directed onto a measurement surface (38) of a measurement object (39) through an outlet window (31),

- a detector arranged in the housing (29) which detects the secondary radiation emitted by the measurement surface (38) of the measurement object (39), and

- a data processing device arranged in the housing (29), which controls at least one display (19) which is provided on the housing (29) or is connected to the housing (29), wherein

- the outlet window (31) is provided on a front-side end of a first housing section (30) of the housing (29) and at least one positioning element (33) is provided on the first housing section (30), allocated to this outlet window (31),

- at least one support element (36) is provided on at least one further housing section (33) of the housing (29), and

- the handheld instrument (14) being configured for alignment with respect to the measurement surface (38) after the positioning of the at least one support

element (36) of the handheld instrument (14) on the measurement surface (38) of the measurement object (39), and the handheld instrument (14) being configured to be self-supporting on the measurement surface (38) by the at least one positioning element (33) and the at least one support element (36), the handheld instrument (14) being positionable autonomously with respect to the measurement surface (38) in a measurement position (57) by way of the at least one positioning element (33) and the at least one support element (36), wherein the at least one support element (36) includes two support elements (36), the at least one positioning element (33) and the two support elements (36) forming a three-point support, or wherein the at least one positioning element (33) includes two positioning elements (33), the two positioning elements (33) and the at least one support element (36) forming a three-point support.

2. The handheld instrument according to claim 1, wherein the housing (29) includes a handle (25) provided on the first housing section (30).

3. The handheld instrument according to claim 1, wherein the at least one positioning element (33) which is adjacent to the outlet window (31) or abuts onto the outlet window (31) is formed as a support surface (37) and the at least one support element (36) arranged on the housing section (32) is formed as a positioning foot.

4. The handheld instrument according to claim 1, wherein fastening elements (41) for fixing the handheld instrument (14) to a receiver (49) or a mount (54) are provided on the receiver (49) of a measurement table

(48), adjacent to the at least one support element (36) or on the at least one support element (36).

5. The handheld instrument according to claim 1, wherein the data processing device controls a radio interface for wireless communication with a further data processing device which is provided separately to the handheld instrument.

6. The handheld instrument according to claim 1, wherein the data processing device in the handheld instrument (14) is able to be controlled by means of a remote control.

7. A mobile device for x-ray fluorescence analysis comprising~~,~~

- a portable transport container (12),

- the handheld instrument (14) according to claim 1, the x-ray fluorescence measurement device provided in the handheld instrument (14) according to claim 1, the handheld instrument being able to be arranged in the transport container (12) and is able to be removed completely from the transport container (12),

a receiver (49) which is able to be arranged in the transport container (12), which at least partially forms a measurement table (48) on which a measurement object (39) is able to be arranged, wherein the handheld instrument (14) is able to be positioned in the transport container (12) with respect to the measurement table (48), wherein the handheld instrument (14) is able to be fastened releasably on the receiver (49) and is able to be arranged in the transport container (12), and

the receiver (49) is formed on one side as a measurement table and a mount (54) for the releasable fastening of the handheld instrument (14) is provided on an opposite side of the receiver (49).

8. The handheld instrument according to claim 1, wherein the at least one support element (36) includes at least one laterally extending surface for engaging the measurement surface (38).

9. The handheld instrument according to claim 2, wherein the at least one further housing section (32) is connected to the first housing section (30) and that the first housing section (30) and the handle (25) are formed to be pistol-shaped.

10. The device according to claim 7, wherein a through-hole (52) is provided in the receiver (49) and the handheld instrument (14) is able to be positioned with respect to or in the through-hole (52) of the receiver (49) using the mount (54) and the handheld instrument (14) is fastened to the mount (54) of the receiver (49) using a plug, clamp or screw connection or a bayonet lock.

11. The device according to claim 7, wherein the transport container (12) has a lower part (21) and a cover (22) which is able to close the lower part and which is arranged on the lower part (21) to be able to be folded open or to be removable and in a closed position with respect to the lower part (21), the cover (22) fixes the receiver (49) to the lower part (21) of the transport container (12).

12. The device according to claim 7, wherein the receiver (49) having a hinge connection (58) is arranged on a side wall of the transport container (12) and the receiver (49) is able to be transferred from a stowage position (47) into a removal position (61) to remove the handheld instrument (14).

13. The device according to claim 7, wherein the mount (54) has at least one centering and/or fixing section (53) for the correct positioning of the handheld instrument (14) with respect to the through-hole (52) of the receiver (49).

14. The device according to claim 7, wherein the mount (54) has at least one opening (66) into which the fastening elements (41) of the handheld instrument (14) are able to be inserted and are able to be arranged in a fastening position with respect to the mount (54).

15. The device according to claim 7, wherein the mount (54) is flush with an upper surface of the measurement table (48).

16. The device according to claim 11, wherein an absorption element (56) is provided in the cover (22) of the transport container (12), which is situated above the through-hole (52) in a stowage position (47) of the receiver (49).

17. The device according to claim 11, wherein the lower part (22) of the transport container (12) has a pivotable and/or removable display (16) and/or the data processing device having the display (16) on an outer side, which is able to be transferred from a non-use position for

transport of the transport container (12) into a use position (42) for the use of the device for x-ray fluorescence analysis.

18. The device according to claim 17, wherein a wireless communication between the handheld instrument (14) and the data processing device or the display (16) or both of the transport container (12), is provided.