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Patent Search

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Abstract:

An autoclave useful for pressure digestion of samples for chemical analysis, consisting of a closeable vessel containing the sample, which during operation sustains elevated temperatures and pressures. The autoclave has a PTFE (Teflon) beaker and lid, in direct contact with each other thus forming a tight seal with an excess-pressure release mechanism. The assembled vessel is held in a device that presses the sealing surfaces of the beaker and lid together, through pressure on a metallic lid support disc. The surfaces of the beaker and lid are free-standing, which permits a direct release of excess-pressure and necessitates an extended clamping device for the lid support disc fixed at a single point.

Complete Specification**Description:FIELD OF INVENTION**

The main field of this invention has a closeable vessel to contain the sample, which during operation is exposed to elevated temperatures and pressures. The vessel consists of a PTFE beaker and lid, which have sealing surfaces in direct contact with each other. The necessary pressure of the lid on the beaker is achieved by an external clamping device which is remote from the seal joint between beaker and lid.

BACKGROUND OF INVENTION

The clamping device presses on the metallic lid support disc at only one point. This clamping device, lid/lid support disc, beaker/beaker support tube, and the free-standing lid/beaker seal act as a simple and effective excess-pressure release mechanism. Pressure digestion autoclaves have been known in diverse forms for a long time. In one case a closeable vessel of inert material (e.g. Teflon) is used. The sample under investigation is put into the beaker, and e.g., mineral acids are added after which the vessel is closed with the lid. The vessel is then heated whereupon the sample decomposes, forming a solution which can be further investigated. Since extremely high pressures can develop during decomposition of the sample, the vessel must be enclosed with a pressure safe container. To increase safety an excess-pressure release mechanism may be included.

SUMMARY

The intent of this invention was to improve upon the design of previously available autoclaves in a manner which would allow operation at high pressures without compromising safety and which would exclude the possibility of contamination of the sample to be analyzed. This intent was realized by developing a free standing vessel whose joint constitutes an excess-pressure release mechanism whereby the clamping of the lid to the beaker is achieved using a device that widely spans the

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