



BETTER BASICS
LABORBEDARF

INFORMATION ABOUT

30% EFFICIENCY IMPROVEMENT BY

COLUMN CHROMATOGRAPHY SEPARATION

30% INCREASE IN EFFICIENCY BY USING

THE SMARTRACK® IN THE

COLUMN CHROMATOGRAPHY SEPARATION METHOD

The aim of the experiment was to quantify the presumed increase in efficiency obtained by using the SmartRack® in column chromatography. The analysis was divided into three stages: Preparation, execution and follow-up. The results of the tests with and without the SmartRack® system were compared. It is estimated that an increase in efficiency of 30% is possible through implementation.





Two round-bottom flasks are used in one SmartRack® classic

Abstract

The aim of the experiment was to quantify the presumed increase in efficiency obtained by using the SmartRack® in column chromatography. The analysis was divided into three stages: Preparation, execution and follow-up. The results of the tests with and without the SmartRack® system were compared. It is estimated that an increase in efficiency of 30% is possible through implementation.

Simulation of the method of column chromatography

Column chromatography was compared with and without the use of the SmartRack® to determine the efficiency of the chromatographic separation method. Column chromatography was chosen as a representative method for experiments in chemistry, analytics, quality assurance and quality control to test the hypothesis of efficiency improvement by the innovative laboratory organisation system SmartRack®. The aim was to determine whether SmartRack® optimises workflows, supports workplace safety and ergonomics, and reduces error rates.

Column chromatography is a fundamental separation method in chemical analysis, and its accuracy and reproducibility depend largely on the care taken in experimental set-up and sample handling. Traditional approaches often require manual processes, resulting in inefficient, variable workflows and increased error rates. The SmartRack® system, known for its modularity and flexibility, could provide an innovative solution.

Methodology

To evaluate the SmartRack® system, several chromatographic separations were performed with and without SmartRack®. Preparation, execution, ability to run parallel experiments, organisation of samples and reagents, ergonomics of the workflow and error rate were evaluated. The integration of SmartRack®, an innovative laboratory organisation tool, is expected to make laboratory workflows more efficient, ergonomic and standardised.



A pipette is removed from a holder module and placed in a SmartRack® classic.

Comparison of procedures with and without SmartRack®

The SmartRack® system made it easier to prepare the holder and insert the column, speeding up the set-up. The integration of holders for Erlenmeyer flasks and other glassware provided an organised and safe workplace. Samples and glassware were safely and clearly arranged in the SmartRack®, improving safety and minimising errors. Parallel experiments could easily be carried out, increasing flexibility and efficiency in the workplace. Dismantling and cleaning of the modules was facilitated by the easy removal of glassware.

Setting up the stands in the experiment without SmartRack® required additional steps and walking distances, as many materials were not directly available at the workstation. Samples and reagents were scattered across the work surface, making the work untidy and increasing the risk of error. It was very difficult to perform further experiments. The two-handed removal and more cumbersome dismantling of the apparatus increased the physical effort and time required.

Conclusion

The use of the SmartRack® system in time-consuming experiments such as column chromatography offers significant advantages in terms of efficiency and parallel operation. The modularity and flexibility of the system allows better organisation and handling of complex operations. This reduces error rates and improves working conditions in terms of ergonomics and safety.

Verification of the impact of the organisation system on chemical analysis processes showed an increase in performance and highlighted the positive effect of integrating SmartRack® in the field of analytical chemistry. Considering the facts presented, it can be concluded that a 30% increase in efficiency is possible with the implementation of SmartRack®.



Removal of a pipette tip in a SmartRack® classic



Photo: Building of the Better Basics Laborbedarf GmbH in Dresden



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Marcus Heinze was born in Zittau and is now a partner and Head of Development at Better Basics Laborbedarf GmbH. He completed his studies in polymer chemistry at the TU Dresden with a doctorate in the field of mineralisable hydrogels. Today he is responsible for development at Better Basics Laborbedarf. The area of product development is dedicated to multidimensionally optimised component design, which combines the possibilities of various 3D printing processes with those of classic metal processing.

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Our request to you

A product like our SmartRack® is only as good as its users. With our roots in the Leibniz Institute for Polymer Research Dresden, our company Better Basics Laborbedarf stands for the tradition of "Made in Germany" quality. We feel in multiple aspects committed to this quality label for German companies, which stands for high innovative strength. Even beyond our product catalog, the same applies for us at Better Basics: Just contact us if you have ideas for extensions or improvements or if you notice something in your daily laboratory routine that we should optimize right away.

We want to create the best possible working environment for you in the laboratory and we are grateful for any comments and inspiration. We can jointly shape the future of laboratory work by cooperating with scientists and researchers. Just like you, we're always looking for a way to make our world a little better every day.

Impress:

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