Environmental aspects and sustainability in the Chemical/Analytical and Biological/Live Science Laboratory

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Laboratories have a huge plastic consumption. They use much energy, water and chemicals. The instrument live time has become significantly shorter with increasing complexity of applications and features. Labs and equipment suppliers put more and more emphasis on improvement of the situation. Companies' procurement starts identifying the topic as part of the purchase decision. With "Pharma 5.0" sustainability got even more focus. However, solutions are not as easy as it looks from high level. It appears, that the industry is moving on both ends: consumers and suppliers.[1]

Companies started with reducing the CO2 footprint in their local production. Some are already officially "neutral". Even if sometimes "green washing" is involved. Instrument design and consumables get an increasing focus on environmental aspects: Footprint (bench space), plastic reduction, optimized packaging for transportation etc. Focus on sustainability throughout the supply chain will follow if it does not have focus yet.

The restriction of PFAS (per- and polyfluoroalkyl substances) as proposed by European ECHA regulators[2] however, would result in a major analytical disaster if there are no exceptions e.g. for Fluoropolymers for components in analytical instruments. Many instruments use items made of Fluoropolymer materials for the reason why they in focus of the ban discussion: they are resistant, persistent and inert. Scientifically it will be a challenge or impossible to replace them with other material and any replacement must be resistant, persistent, and inert.[3]

Concepts, including artificial Intelligence and optimised reaction control and monitoring[4] are another strategy to reduce lab work with chemicals or at least being more targeted with that. Let us put some light on the topics.

[1] https://pharmaceuticalmanufacturer.media/pharmaceutical-industry-insights/latest-pharmaceutical-manufacturing-industry-insights/roundtable-accelerating-the-path-towards-sustainable-future-proofed-qc/ Opened 10.6.2023
[2] https://echa.europa.eu/-/echa-publishes-pfas-restriction-proposal Opened 10.6.2023
[3] https://www.spectaris.de/fileadmin/Content/Verband/Positionen/20200807_SPECTARIS_Standpunkt_PFAS_final.pdf Opened 10.6.2023
[4] https://www.azom.com/equipment-details.aspx?EquipID=7404 Opened 10.6.2023