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HPTLC : FASTER, CHEAPER AND MORE RELIABLE, IS ALSO THE BEST SOLUTION FOR BIODETECTION

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HPTLC is the High-Performance version of Thin-Layer Chromatography. This liquid chromatography on plates covered with silica gel, modified silica, alumina, or cellulose is an off-line method. This means that the entire sample remains accessible during the chromatographic process. This gives several advantages including the possibility for running a bio reaction on the plate easily. The Effect Directed Analysis (EDA) is covering many different ways and media which may interact with the substances on the plate. This poster will review the possibilities offered by the HPTLC method regarding EDA, which may be switched in two branches [1]: biochemical staining when a substance, an enzyme for example, is used to react with the compounds, and microbiological when an organism, a bacteria for example, is used for the bioassay on the plate. Typical examples of the use of these different methods will be displayed.

Besides this detection flexibility, HPTLC is running the samples in parallel, up to 20-30 on one side, or the double on both side, when a horizontal chamber is used for separation. A few consumption of solvent, speed of separation and the number of samples treated simultaneously add to the method a very good profile for being used in High Throughput Screening. The EDA-HPTLC method has the advantage of offering two steps in one: chromatography and bioassay. It is therefore again reducing the time to get the final result of a sample. This is a must not only in the industry but also in academic research where the competition is very effective nowadays.

When the samples are really complex and very rich in matrix, the AMD method is a must. This method enables a separation power 4 times higher. It does also increase the sensitivity and enables a smart matrix management.

The acceptance of the microbiological methods is still not very high because the correlation between a reaction with a micro-organism and a real activity on human metabolism is questionable. Nevertheless this gives an economic and rapid new detection way, which has already proven to detect some invisible substances otherwise. Biochemical methods have shown a larger development because the precision and reliability are quite high in most cases. The capability to show directly the positive result towards a searched effect, toxic for example, gives strength to these methods.

This method benefits of the separated sample remaining on the plate. But for quantitative aspects and especially high sensitivity, high application volumes of any matrix combined with selective detection, may lead to unexpected low quantification limits.

The International Symposium for HPTLC last held in Lyon (July 2014), dedicated special sessions to bio-detection. Next issue will take place in Berlin, Germany in July 2017 (www.hptlc.com). One of the previous meetings of the French TLC Club [3] which meets twice a year since 1998 was also focused on these detection aspects.

Literature:

[1] G.Morlock, W. Schwack, Journal of Chromatography A, 1217 (2010) 6600–6609.

[2] www.clubdeccm.com