

Is digital scanner suitable as cheaper alternative of a spectrophotometer?

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Arrays and microarrays have become increasingly popular as tools for biological research using different capture agents in arrays in order to detect DNA/RNA, proteins, carbohydrates, *etc.* [1]. This concept was also enlarged to identification and sensing of other chemical entities, *e.g.*, ions, vapours, small organic molecules, *etc.* [1,2]. Technological advances such device miniaturization in combination with CCD technology (*e.g.*, digital scanner/camera or cell phone) have enabled to measure the experimental datasets by easier way using available hardware and software tools than in lab on spectrophotometer [1].

In this contribution, it is demonstrated how the digital scanner could be employed for fast and routine analysis of some analytes in biological samples. The parameters for procedure of scanning by digital scanner have been optimized in order to treat the experimental data by newly developed software ScanQuant2. The determination of Cu(II) and ammonium ions with commercial analytical strip papers as well as 96-well plates using digital scanner shows that it can be employed as suitable alternative for classical spectrophotometer. In addition, the methodology developed for analysis of ammonium ions was also utilized for enzymatic determination of urea.

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REFERENCES

- [1] Anzenbacher P. Jr., Lubal P., Buček P., Palacios M.A., Kozelkova M.E.: *Chem. Soc. Rev.*, 39 (2010), 3954-3979.
- [2] Šídlo M., Lubal P., Anzenbacher P. Jr.: *Chemosensors*, 9 (2021), 39.