
FROM THE EDITOR IN CHIEF

Physicists–Analysts

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It is very good that today physicists enter analytical society on equal footing with chemists. Among them are experts in atomic emission spectrometry, X-ray fluorescence, and nuclear physics methods; designers of analytical instruments; and many others. Most of the physicists understand that they are dealing with chemical analysis and do not stand apart from analytical chemists; moreover, many physicists closely collaborate with chemists. However, close contacts most often arise when new physical methods of analysis are being developed, in particular, at the stage of their practical introduction. An illustrative exception was the invention of atomic emission analysis due to the joint research by the physicist H. Kirchhoff and the chemist R. Bunsen. However, new physical methods are often developed by “pure” physics. Thus, mass spectrometry was invented under the aegis of the physicist J.J. Thomson, and fundamental contributions to the development of this method were made by the physicists F. Aston, A. Dempster, A. Nier, and others. Pioneer research in X-ray spectrochemical analysis was conducted by the physicist G. Moseley and, later, D. Hevesy. X-ray photoelectron spectrometry was proposed by the physicist K. Siegbahn and Mössbauer spectroscopy by the physicist R. Mössbauer. Most nuclear physics methods were also proposed by physicists.

It is important from the methodological viewpoint that, at the invention and early stages of the development of physical methods, their authors might not recognize that they have made a contribution to the methodology of chemical analysis. They might be greatly

astonished if told that they were dealing with analytical chemistry.

The initial steps in the development of physical methods can also be observed nowadays. For example, methods for medical diagnosis by analyzing exhaled air are being developed at the Institute of General Physics of the Russian Academy of Sciences. These methods are highly promising, and the Director of the Institute had presented them at a meeting of the Presidium of the Russian Academy of Sciences. The analysis of exhaled air by new spectroscopic methods gives concentrations of various gaseous substances; the presence or unusual concentrations of some substances are markers of some diseases. The researchers do not expect that they can submit articles to journals on analytical chemistry: they are physicists and search for useful applications of the proposed physical methods. Some time must pass before professional analysts will learn about these methods and physicists, the authors of these methods, will understand that contacts with professional analysis can be useful for them. In fact, analysts better know problems of sampling, calibration, the processing of analytical results, and so on.

Some other physicists at the same institute decided to use gas chromatography in their research. They took thick columns and untreated coarse-grained adsorbents; their experience in optimizing gas flows was insufficient. A simple consultation with analytical chromatographers could have significantly improved the results obtained.

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