

## Fluorescence-based temperature control for dynamics of microwave heating procedures

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The method of dynamic thermometry, based on the temperature dependence of some parameters of the fluorescence spectrum, is used to control the heating of liquid media in a microwave oven. The solution of organic dye rhodamine 6G is used as a temperature-sensitive sensor. Traditional intensity-based fluorescence thermometry of liquids, operates in a limited temperature range. To extend the range to the boiling point, temperature dependences of other parameters of the fluorescence spectrum were measured. For an aqueous solution of R6G the peak wavelength and asymmetry coefficient are equally convenient parameters. For a glycerin solution, it is preferable to measure the peak wavelength. Measurements of the solutions temperature when heated in a microwave oven showed high accuracy and reproducibility of the temperature-time profiles. The described technique has the potential to study in depth the dynamic temperature changes under microwave irradiation and can be used to register fast processes, control the spatial distribution of temperature and identify possible anomalies confirming the existence of specific and non-thermal effects of microwaves.

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