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Abstract: Routine microwave heating and processing are established technologies and have been successfully applied to various fields. However, the discharge phenomenon caused by the interaction between microwave and metals or semiconductors (with sharp edges, tips or submicroscopic irregularities) has not yet been thoroughly studied. The discharge induced by microwaves is a complicated process, which may contain a variety of physical and chemical phenomena. Because of the lack of trapping and characterization tools, it is quite difficult to directly study the instantaneous process of microwave-metal discharge. In this study, the heat generation was isolated by liquid paraffin oil and measured with a direct calorimetric

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