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Thermal and spectroscopic studies of the antioxidant food additive propyl gallate

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1 Thermal and spectroscopic studies of the antioxidant food additive propyl gallate

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9 Abstract

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11 Literature mentions propyl gallate (PG) as a non-toxic synthetic antioxidant that can be
12 used as a food additive due to its high tolerance to heat. It is important to understand the
13 thermal properties and to identify the decomposition products of this substance, since it
14 has been reported to be thermally stable at temperatures as high as 300 °C.
15 Simultaneous thermogravimetry-differential thermal analysis (TG-DTA), differential
16 scanning calorimetry-photovisual (DSC-photovisual), coupled thermogravimetry-
17 infrared spectroscopy (TG-FTIR) analyses and spectroscopic techniques were used to
18 study the food additive PG. The TG-DTA curves, which were performed with the aid of
19 DSC-photovisual, provided information concerning the thermal stability and
20 decomposition profiles of the compound. From the TG-FTIR coupled techniques, it was
21 possible to identify n-propanol as a possible volatile compound released during the
22 thermal decomposition of the antioxidant. A complete spectroscopic characterization in
23 the ultraviolet, visible, near and middle infrared regions was performed in order to
24 understand the spectroscopic properties of PG.

25
26 **Keywords:** Propyl gallate, Thermal behaviour, Spectroscopic studies, Coupled TG-
27 FTIR, DSC-photovisual

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