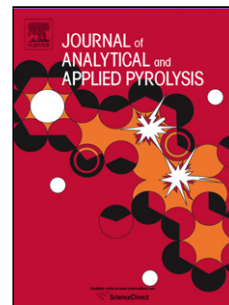


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## Microwave assisted pyrolysis of crop residues from *Vitis vinifera*

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### Highlights

- Crop residues from *Vitis vinifera* were pyrolyzed using a multimode microwave oven.
- A very fast pyrolysis was realized using Carbon as MW absorber.
- A high amount of bio-oil (34.9 wt%) was obtained in the presence of Fe as MW absorber.
- Large production of bio-char and gas were obtained using SiC as MW absorbers.

### Abstract

A fast pyrolysis of crop residues of *Vitis vinifera* has been realized using a multimode microwave (MW) oven using various MW absorbers. The combination of absorber/reactor arrangement address the process towards a high formation of bio-oil (34.9 %) and gas (45.7 %) or the production of large amount of bio-char (up to 71.4%).

Bio-oils were collected as dark brown liquids with low viscosity and density. They were characterized through analytical and spectroscopic methods and the compounds present were identified and quantified. Large amount of acetic acid (up to 172.5 g/L) and appreciable amount of aromatics (up to 39.5 g/L) were formed in all experiments. Bio-oil obtained using carbon as MW absorber and set-up B showed the lower water concentration (39.5 wt%).

Bio-chars formed in all tests showed almost the same calorific values, close to that of commercial pellets.

The MAP of vine residues is a sound way to reduce environmental risks for their disposal and gave usefully chemicals, mainly acetic acid, aromatics and fuels through a fast pyrolysis process.

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