Pulsed Microwave-accelerated esterification of free fatty acid

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It was demonstrated that pulsed microwave irradiation is a more effective method to accelerate esterification of free fatty acid with a heterogeneous catalyst. A square-pulsed microwave with a 400 Hz repetition rate and a 10–20% duty cycle with the same energy as the continuous microwave were used in this study. The pulsed microwaves improved the esterification conversion from 39.9% to 66.1% after 15 min in comparison with the continuous microwave under the same reaction conditions. These results indicated that pulsed microwaves with repetitive strong power could enhance the efficiency of biodiesel production relative to the use of continuous microwave with mild power.