

## **SINTESIS TURUNAN KALIKS[4]-2-METILRESORSINARENA DAN UJI AKTIVITASNYA SEBAGAI ANTIOKSIDAN**

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### **INTISARI**

Telah dilakukan sintesis turunan kaliks[4]-2-metilresorsinarena dan uji aktivitasnya sebagai senyawa antioksidan. Penelitian ini bertujuan untuk melakukan sintesis senyawa turunan kaliks[4]-2-metilresorsinarena yaitu C-fenilkaliks[4]-2-metilresorsinarena (**CFK4MR**), C-2-klorofenilkaliks[4]-2-metilresorsinarena (**CKFK4MR**), C-4-flourofenilkaliks[4]-2-metilresorsinarena (**CFFK4MR**), C-4-hidroksi-3-metoksifenilkaliks[4]-2-metilresorsinarena (**CHMFK4MR**), dan C-4-etoksi-3-metoksifenilkaliks[4]-2-metilresorsinarena (**CEMFK4MR**) serta menguji aktivitas senyawa hasil sintesis sebagai senyawa antioksidan melalui metode 2,2-difenil-1-pikrilhidrazil (**DPPH**).

Senyawa turunan kaliks[4]-2-metilresorsinarena disintesis dengan mereaksikan 2-metilresorsinol dengan variasi aldehida yaitu benzaldehida, 2-klorobenzaldehida, 4-flourobenzaldehida, vanilin, dan 4-etoksi-3-metoksibenzaldehida dalam pelarut etanol dan katalis HCl selama 24 jam. Produk hasil sintesis dikarakterisasi dengan menggunakan FTIR untuk mengetahui gugus-gugus fungsional yang ada, <sup>1</sup>H-NMR untuk mengetahui jumlah dan tipe proton, <sup>13</sup>C-NMR untuk mengetahui jumlah dan tipe karbon, dan LC-MS untuk mengetahui waktu retensi dan massa molekulnya. Aktivitas antioksidannya diuji menggunakan metode DPPH.

Senyawa **CFK4MR**, **CKFK4MR**, **CFFK4MR**, **CHMFK4MR**, dan **CEMFK4MR** berhasil disintesis dengan persen hasil berturut-turut yaitu 67,00; 95,12; 99,13; 99,22; dan 92,31%. Senyawa **CFK4MR**, **CKFK4MR**, **CFFK4MR**, **CHMFK4MR**, dan **CEMFK4MR** hasil sintesis memiliki aktivitas antioksidan dengan nilai IC<sub>50</sub> sebagai berikut 47,73 µg mL<sup>-1</sup> (sangat kuat), 159,97 µg mL<sup>-1</sup> (sedang), 45,95 µg mL<sup>-1</sup> (sangat kuat), 19,12 µg mL<sup>-1</sup> (sangat kuat), dan 59,78 µg mL<sup>-1</sup> (kuat).

Kata kunci : 2-metilresorsinol, antioksidan, kaliks[4]2-metilresorsinarena, metode DPPH.

***SYNTHESIS OF CALIX[4]-2-METHYLRESORCINARENE DERIVATIVES  
AND THEIR ACTIVITY TEST AS ANTIOXIDANT***

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**ABSTRACT**

Synthesis of calix[4]-2-methylresorcinarene derivatives and their activity test as antioxidant had been conducted. This research aims to perform the synthesis of C-phenylcalix[4]-2-methylresorcinarene (**CFK4MR**), C-2-chlorophenylcalix[4]-2-methylresorcinarene (**CKFK4MR**), C-4-chlorophenylcalix[4]-2-methylresorcinarene (**CFFK4MR**), C-4-hydroxy-3-methoxyphenylcalix[4]-2-methylresorcinarene (**CHMFK4MR**), and C-4-ethoxy-3-methoxyphenylcalix[4]-2-methylresorcinarene (**CEMFK4MR**) and to test their activity as antioxidant by DPPH method.

The calix[4]-2-methylresorcinarene derivative was synthesized by reacting 2-methylresorcinol and variations of aldehydes i.e. benzaldehyde, 2-chlorobenzaldehyde, 4-fluorobenzaldehyde, vanillin, and 4-ethoxy-3-methoxybenzaldehyde in ethanol and with concentrated hydrochloric acid catalyst for 24 hours. The products of the synthesis were characterized using FTIR to determine the existing functional groups, <sup>1</sup>H-NMR to determine the number and type of proton, <sup>13</sup>C-NMR to determine the amount and type of carbon, and LC-MS to determine the retention time and molecular mass. The antioxidant activity test of calix[4]-2-methylresorcinarene derivatives were done using 2,2-diphenyl-1-picrylhydrazyl (**DPPH**) method.

All synthesis experiments afforded the expected products in the percent yields as the following: **CFK4MR** 67.00%, **CKFK4MR** 95.12%, **CFFK4MR** 99.22%, **CHMFK4MR** 99.13%, and **CEMFK4MR** 92.31%. The value of IC<sub>50</sub> as antioxidant of **CFK4MR**, **CKFK4MR**, **CFFK4MR**, **CHMFK4MR**, and **CEMFK4MR** were 47.73 µg mL<sup>-1</sup> (very strong), 159.97 µg mL<sup>-1</sup> (medium), 45.95 µg mL<sup>-1</sup> (very strong), 19.12 µg mL<sup>-1</sup> (very strong), and 59,78 µg mL<sup>-1</sup> (strong).

Keywords: 2-methylresorcinol, antioxidant, calix[4]-2-methylresorcinarene, DPPH method.