

## INTISARI

Senyawa 2-benzilidensikloheksana-1,3-dion dilaporkan dapat beraktivitas sebagai inhibitor *angiogenesis*. Salah satu senyawa yang dapat dikembangkan sebagai inhibitor *angiogenesis* adalah 2-(4'-klorobenzilidena)sikloheksanadion. Senyawa ini merupakan modifikasi dari 2-benzilidensikloheksana-1,3-dion, dengan menambahkan gugus kloro pada cincin benzenanya. Gugus kloro diduga dapat memperkuat aktivitas senyawa 2-(4'-klorobenzilidena)sikloheksanadion sebagai inhibitor *angiogenesis* karena dapat membuat posisi *beta* menjadi semakin positif.

Sintesis 2-(4'-klorobenzilidena)sikloheksanadion dilakukan dengan mereaksikan 1,3 sikloheksanadion 3mmol dan 4-klorobenzaldehid 3mmol menggunakan katalis KOH melalui reaksi kondensasi aldol silang. Analisis untuk senyawa hasil sintesis meliputi: uji organoleptis, uji kelarutan, uji Kromatografi Lapis Tipis (KLT), uji titik lebur, elusidasi struktur dengan spektroskopi *infra-red* (IR) dan kromatografi gas-spektrometri massa (GC-MS), dan uji kualitatif dengan menghitung *crude product*.

Senyawa hasil sintesis berupa serbuk halus, berwarna putih, tidak berbau, larut dalam kloroform dan tidak larut dalam aquadest, agak larut dalam metanol dan etanol, jarak lebur antara 217-221<sup>0</sup>C dan *crude product* 0,363g. Hasil uji KLT dengan fase gerak kloroform : etil asetat (9 : 1) dan fase diam silika gel GF<sub>254</sub> adalah R<sub>f</sub> sebesar 0,370. Berdasarkan hasil kromatogram GC senyawa hasil sintesis, terlihat bahwa selain terdapat senyawa 2-(4'-klorobenzilidena)sikloheksanadion sebesar 10,27%, juga terdapat senyawa hasil reaksi samping yaitu (4Z)-4-(4-klorobenzilidena)-2-(3-oksosikloheks-1-enil)sikloheksan-1,3-dion sebesar 89,07%. Keberadaan dua senyawa tersebut dipertegas melalui hasil spektra IR dan MS.

Kata kunci : 1,3-sikloheksanadion, 4-klorobenzaldehid, 2-(4'-klorobenzilidena)sikloheksanadion, inhibitor *angiogenesis*, reaksi kondensasi aldol silang.

## ABSTRACT

Compound of 2-benzilidenecyclohexane-1,3-dion is known to have activity as an angiogenesis inhibitor. One of compound which can be developed as angiogenesis inhibitor is 2-(4'-chlorobenzilidene)cyclohexanadion. This compound was modiflicated from 2-benzilidenecyclohexane-1,3-dion by adding cloro group on benzene. Cloro's group predicted to increase the activity 2-(4'-chlorobenzilidene)cyclohexanadion as an angiogenesis inhibitor because can cause the beta position became more positive.

Synthesis 2-(4'-chlorobenzilidene)cyclohexanadion carried out using cyclohexane-1,3-dion 3mmol and 4-clorobenzaldehyde 3mmol with potassium hydroxide as the catalyst through crossed aldol condensation reaction. Analysis of compound synthesizing by : organoleptic test, solubility test, Thin Layer Chromatograpy test, melting point test, and elucidation with Infra Red (IR) spectroscopy and Gas Chromatography-Mass Spectroscopy (GC-MS) and quantitative test involved the calculation of the crude product.

The result of this synthesis is a compound with fine powder form, white colors, odorless, soluble in chloroform, slightly soluble in aquadest, freely soluble in methanol and ethanol, melting point between 217-221<sup>0</sup>C, the crude product is 0,363g. TLC test with chloroform : acetic ethyl (9 : 1) as mobile phase and gel silica GF<sub>254</sub> with R<sub>f</sub> value was 0,370. Based on the results of the GC chromatograms of compounds synthesized, we have seen that in addition to compound 2-(4'-chlorobenzilidene)cyclohexanadion amounted to 10,27%, there are also compounds the side reactions are (4Z)-4-(4-clorobenzilidene)-2-(3-oxocyclohex-1-enil)cyclohexane-1,3-dion amount of 89,08%. The presence of two compounds were confirmed by the results of IR and MS spectra.

Key words : cyclohexane-1,3-dion, 4-clorobenzaldehyde, 2-(4'-chlorobenzilidene)cyclohexanadion, angiogenesis inhibitor, crossed aldol condensation reaction