

**Studi Literatur tentang Cairan Ionik Magnetik-Luminesen Berbasis  
Kompleks Unsur Tanah Jarang yang Difungsionalisasi  
Menggunakan Molekul Antena**

**SKRIPSI**

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Sains  
Program Studi Kimia



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ALAM  
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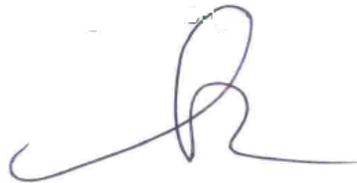
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## ABSTRAK

Cairan ionik magnetik (*Magnetic Ionic Liquids*, MILs) merupakan media yang sangat berguna, salah satunya adalah sebagai pelarut ekstraksi. Lantanida memiliki luminesensi yang khas tiap unsurnya. Cairan ionik sebagai luminesen memiliki banyak manfaat, salah satunya ialah untuk mendeteksi gen. Intensitas luminesensi dapat ditingkatkan dengan menggunakan molekul antena sebagai ligan. Makalah ini akan meninjau hasil studi ilmiah mengenai pengaruh ligan dalam luminesensi cairan ionik magnetik. Tinjauan ini memuat 5 artikel dengan kisaran tahun 2010–2019 dengan ligan  $\beta$ -diketonat, CAPH, Halida dan sakarinat yang berperan sebagai molekul antena. Penelitian ini meninjau metode sintesis, waktu hidup luminesensi, dan efisiensi transfer energi (efisiensi kuantum) MILs. Metode sintesis yang digunakan pada tiap MILs ialah khelasi. Waktu hidup luminesensi yang paling tinggi diperoleh  $[C_4mpy]_3[Eu(Sac)_6][CH_3CN]$ , dengan waktu hidup luminesensinya sebesar 5,31 (77 K) dan 3,85 ms (298 K). Sedangkan, efisiensi kuantum tertinggi diperoleh  $PPh_4[EuL_4]$ , dengan efisiensi kuantum sebesar 68%.

Kata kunci: Cairan Ionik Magnetik; Cairan Ionik Magnetik-Luminesen; Kompleks Unsur Tanah Jarang; Molekul Antena.

## ABSTRACT

*Magnetic ionic liquids (MILs) are very useful media, one of which is as an extraction solvent. Lanthanides have a unique luminescence for each element. Ionic liquid as luminescence has many benefits, one of which is to detect genes. The luminescence intensity can be increased by using the antenna molecules as ligands. This paper will review the results of scientific studies regarding the effect of ligands on the luminescence of magnetic ionic liquids. This review contains 5 articles ranging from 2010–2019 with  $\beta$ -diketonic ligands, CPh, Halides and saccharinates acting as antenna molecules. This study reviews the synthesis method, luminescence lifetime, and energy transfer efficiency (quantum efficiency) of MILs. The synthesis method used in each MIL is chelation. The highest luminescence lifetime was obtained by  $[C4mpy]_3[Eu(Sac)_6][CH_3CN]$ , with luminescence lifetimes of 5.31 (77 K) and 3.85 ms (298 K). Meanwhile, the highest quantum efficiency was obtained by  $PPh_4[EuL_4]$ , with a quantum efficiency of 68%.*

*Keywords: Magnetic Ionic Liquids; Luminescent Magnetic Ionic Liquids; Rare Earth Element Complexes; Antenna Molecules.*

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