

## Sintesis Katalis PtNiCo/CNS dan PtNiCoAg/CNS untuk Reaksi Dehidrogenasi Hidrazin Hidrat = Synthesis of PtNiCo/CNS and PtNiCoAg/CNS Catalysts for Hydrazine Hydrate Dehydrogenation Reaction

Anggi Angraini, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920518581&lokasi=lokal>

---

### Abstrak

Pengembangan energi berbasis hidrogen dilakukan untuk menggantikan energi konvensional yang tidak ramah lingkungan. Senyawa penyimpan hidrogen, hidrazin hidrat ( $N_2H_4 \cdot H_2O$ ) dapat menghasilkan hidrogen dengan produk samping  $N_2$  melalui reaksi dekomposisinya. Katalis PtNi, PtCo, NiCo, PtNiCo, dan PtNiCoAg dengan pendukung karbon nanosphere (CNS) disintesis melalui proses impregnasi basah dan dikarakterisasi dengan XRD, XRF, SAA, FESEM-EDX, dan TEM. Pengaruh dari variasi komposisi logam, suhu, NaOH, dan keberulangan pemakaiannya dievaluasi dan dipelajari terhadap aktivitas dan selektivitas katalitik. Katalis trimetalik Pt<sub>0,2</sub>Ni<sub>0,2</sub>Co<sub>0,6</sub>/CNS memiliki aktivitas katalitik tertinggi dengan penambahan 2 mmol NaOH pada suhu 343 K dengan nilai TOF 757,34 h<sup>-1</sup>, selektivitas 62,82%, dan energi aktivasi 35,226 kJ/mol yang menunjukkan efek sinergis dari logam Pt, Ni, dan Co pada pendukung karbon nanosphere.

.....The development of hydrogen-based energy is carried out to replace conventional energy which is not environmentally friendly. The hydrogen storage compound, hydrazine hydrate ( $N_2H_4 \cdot H_2O$ ) can produce hydrogen with  $N_2$  as a by-product through its decomposition reaction. PtNi, PtCo, NiCo, PtNiCo, and PtNiCoAg catalysts with carbon nanospheres (CNS) support were synthesized via wet impregnation process and characterized by XRD, XRF, SAA, FESEM-EDX, and TEM. The effects of variations in metal composition, temperature, NaOH, and reusability were evaluated and studied on catalytic activity and selectivity. The trimetallic catalyst Pt<sub>0.2</sub>Ni<sub>0.2</sub>Co<sub>0.6</sub>/CNS had the highest catalytic activity with the addition of 2 mmol NaOH at 343 K with a TOF value of 757.34 h<sup>-1</sup>, a selectivity of 62.82%, and an activation energy of 35.226 kJ/mol which shows the effect synergy of Pt, Ni, and Co metals on the carbon nanospheres support.