

**IMOBILISASI 1-(2-PIRIDILAZO)-2-NAFTOL (PAN) DALAM FILM
POLIVINIL ALKOHOL (PVA) DAN APLIKASINYA SEBAGAI SENSOR
KOLORIMETRI ION Ni²⁺**

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INTISARI

Imobilisasi 1,2-piridilazo-2-naftol (PAN) dengan polovinil alkohol (PVA) telah berhasil disintesis sebagai matriks film untuk penentuan Ni²⁺ secara kolorimetri. Penelitian ini bertujuan untuk memperoleh kondisi optimum serta metode validasi terhadap kinerja film PVA-PAN/Ni²⁺. Pengaruh logam interferen dipelajari untuk mengetahui selektivitas dari film PVA-PAN/Ni²⁺.

Sintesis film PVA dilakukan dengan melarutkan PVA dalam akuades hingga homogen. Film direndam dengan NaOH bertujuan membuat film lebih mengembang. Imobilisasi PAN ke dalam film PVA dilakukan dengan metode perendaman. Karakteristik film dianalisis menggunakan FTIR dan SEM. Kondisi optimum deteksi diperoleh dengan mengukur absorbansi film pada panjang gelombang, variasi konsentrasi PAN, pH dan waktu. Selektivitas film diuji dengan membandingkan absorbansi film terhadap larutan Ni²⁺ sebelum dan setelah penambahan logam interferen.

Konsentrasi optimum reagen yang dapat terimobilisasi ke dalam film PVA ialah 0,3%. Absorbansi film diukur pada panjang gelombang 544 nm setelah proses deteksi selama 6 menit pada pH 6. Film PVA-PAN memiliki selektivitas yang baik terhadap Zn²⁺, Cu²⁺, Pb²⁺, Hg²⁺, Mn²⁺, Mg²⁺, Cd²⁺, Fe²⁺ dan Cr⁶⁺ kecuali terhadap Co²⁺. Linieritas film PVA-PAN/Ni²⁺ adalah 0,997 dengan batas deteksi dan batas kuantifikasi sebesar 0,091 mg L⁻¹ dan sebesar 0,302 mg L⁻¹. Film PVA-PAN/Ni²⁺ memiliki presisi dan akurasi yang baik dengan nilai RSD < 5% dan hasil perolehan kembali sebesar 95-108%.

Kata Kunci: 1-(2-piridilazo)-2-naftol (PAN), film PVA, Ni²⁺, sensor kimia

***IMMOBILIZATION OF 1-(2-PYRIDYLAZO)-2-NAPHTHOL (PAN) INTO
POLYVINYL ALCOHOL (PVA) FILM AND APPLICATION AS
COLORIMETRIC SENSOR FOR Ni²⁺ ION***

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ABSTRACT

Immobilization of 1-(2-pyridilazo)-2-naphthol with PVA has been synthesis as a matrix film for the colorimetric determination of Ni²⁺. This study aimed to obtain the optimum conditions and the validity of the method using PVA-PAN films. The influence of interference metals was studied to determine the selectivity of PVA-PAN films.

The synthesis of PVA-PAN films was carried out by dissolving PVA into distilled water until homogenous. The films soaked with NaOH to the aims of film swelling immobilization of 1-(2-pyridilazo)-2-naphthol to PVA films were done by immersion method. The characteristics of the film were analyzed using FTIR and SEM. The optimum conditions were determined by measuring the absorbance of the film at wavelength, various pH, time, PAN concentrations. The selectivity of the film was determined by comparing the absorbance of the film to the solution of Ni²⁺ before and after the addition of interference metal.

The optimum concentration of PAN could be immobilized in PVA films was 0,3%. The optimum absorbance of the films was measured at 544 nm for 6 minutes at pH 6. PVA films have good detectivity for Zn²⁺, Cu²⁺, Pb²⁺, Hg²⁺, Mn²⁺, Mg²⁺, Cd²⁺, Fe²⁺ dan Cr⁶⁺, except Co²⁺. The linearity of PVA-PAN/Ni²⁺ films was 0.997 with a limit of detection and limit of quantification as low as 0.091 mg L⁻¹ and 0.302 mg L⁻¹. Film sensors have good precision and accuracy with RSD<5% and recovery value between 95-108%.

Keywords: 1-(2-pyridilazo)-2-naphthol (PAN), PVA film, Ni²⁺, chemical sensor