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All Solid-State Contact Lead(II) Ion-selective PVC Membrane Electrode Using Dimethylene Bis(4-methylpiperidinedithiocarbamate) Neutral Ionophore

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Abstract: All solid-state contact PVC membrane electrodes for lead(II) ion were developed by using dimethylene bis(4-methylpiperidinedithiocarbamate) as neutral carrier and nitrophenyloctyl ether or dioctylsebacate as plasticizers. Response properties of the all solid-state contact PVC membrane electrode prepared with nitrophenyloctyl ether were better than those of the membrane electrode prepared with dioctylsebacate. The nitrophenyloctyl ether plasticized the all solid-state contact PVC membrane electrode and exhibited a good linear response of 30 mV/decade for lead(II) ion within the concentration ranges $0.1\text{-}5\times10^{-6}$ mol dm^{-3} lead(II) nitrate, good selectivity over alkali, alkali-earth and transition metal ions including copper(II) ion by a factor of at least 10^{3}, 10^{4} and 10^{2} respectively, and a short response time. The useful pH range was between 2.0 and 6.0.

Key Words: All solid-state contact; lead(II) ion-selective membrane electrode; Dimethylene bis(4-methylpiperidinedithiocarbamate) Ionophore.

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