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**PULSED AMPEROMETRIC DETECTION AT GOLD ELECTRODE FOR DETERMINATION  
OF SOME ANTIBIOTIC DRUGS APPLIED TO FLOW INJECTION SYSTEM**

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การตรวจวัดทางเคมีไฟฟ้าของยาปฏิชีวนะเตตราไซคลิน ได้แก่ เตตราไซคลิน  
ไฮโดรคลอไรด์ คลอร์เตตราไซคลินไฮโดรคลอไรด์ และด็อกซีไซคลินไฮโดรคลอไรด์ ได้  
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The electrochemical determination of tetracycline antibiotics including tetracycline hydrochloride, chlortetracycline hydrochloride, and doxycycline hydrochloride was performed by pulsed amperometric detection (PAD) applied to flow injection system. The electrochemical behavior of these drugs was investigated by rotating disk voltammetry at gold rotating disk electrode (Au RDE) as a function of pH of supporting electrolyte, potential scan rate, and electrode rotation speed. The well-defined cyclic voltammograms provided highest oxidation peak current were obtained when using  $\text{KH}_2\text{PO}_4$  solution pH 2, 2.5, and 2 for tetracycline hydrochloride, chlortetracycline hydrochloride, and doxycycline hydrochloride, respectively. The potential scan rate and electrode rotation speed dependence studies indicated that the convective-diffusion mass transport process controlled the anodic responses of all analytes. In flow injection system, the PAD waveform parameters were optimized for determination of tetracyclines by the application of continuous potential pulse to a gold disk electrode. The carrier solution was 0.1 M  $\text{KH}_2\text{PO}_4$  solution at the optimal pH for each analyte and the flow rate was  $1 \text{ ml min}^{-1}$ . The optimized PAD waveforms were applied to the investigation of both analytical performances including linear range, detection limit, and repeatability of the proposed method and the amounts of tetracyclines in real sample drug capsules. It was found that the results were satisfactory, which provided good analytical performances and the percent recovery results.

Department..... Chemistry ..... Student's signature..... *Sanit Palaharn*  
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## ABBREVIATIONS

$i$	-	current (A)
$i_{pa}$	-	anodic peak current (A)
$i_{pc}$	-	cathodic peak current (A)
$E_p$	-	peak potential (V)
$E_{pa}$	-	anodic peak potential (V)
$E_{pc}$	-	cathodic peak potential (V)
RDE	-	rotating disk electrode
r.p.m.	-	revolution per minute
$F$	-	Faraday constant (96,484.6 C equiv <sup>-1</sup> )
$A$	-	area of electrode (cm <sup>2</sup> )
$D$	-	diffusion coefficient (cm <sup>2</sup> s <sup>-1</sup> )
$\nu$	-	kinematic viscosity of the liquid (cm <sup>2</sup> s <sup>-1</sup> )
$\upsilon$	-	scan rate (V sec <sup>-1</sup> )
$\omega$	-	angular velocity of the disk (radians per second)
$C$	-	solution concentration (mol dm <sup>3-1</sup> )
$E_{det}$	-	detection potential (V)
$E_{oxd}$	-	oxidation potential (V)
$E_{red}$	-	reduction potential (V)
$t_{det}$	-	detection time (sec)
$t_{del}$	-	delay time (sec)
$t_{int}$	-	integration time (sec)
$t_{oxd}$	-	oxidation time (sec)
$t_{red}$	-	reduction time (sec)