Supporting Information

Kinetics and chemistry of hydrolysis of ultrathin, thermally grown layers of silicon oxide as biofluid barriers in flexible electronic systems

Yoon Kyeung Lee[†], Ki Jun Yu[†], Yerim Kim, Younghee Yoon, Zhaoqian Xie, Enming Song, Haiwen Luan, Xue Feng, Yonggang Huang, John A. Rogers*

Y. K. Lee
Department of Chemistry
University of Illinois at Urbana-Champaign
Urbana, IL 61801, USA

Y. K. Lee, Y. Kim, Y. Yoon, E. Song
Department of Materials Science and Engineering
Frederick Seitz Materials Research Laboratory
University of Illinois at Urbana-Champaign
Urbana, IL 61801, USA

Prof. K. J. Yu
Department of Electrical and Electronic Engineering
Yonsei University
Seoul, 03722, Republic of Korea

E. Song
Department of Materials Science
Fudan University
Shanghai 200433 (P. R. China)

Dr. Zhaoqian Xie
Department of Civil and Environmental Engineering, Mechanical Engineering, and Materials Science and Engineering, Northwestern University, Evanston, IL 60208, USA

AML, Department of Engineering Mechanics, Center for Mechanics and Materials
Tsinghua University
Beijing 100084, China

Haiwen Luan, Prof. Yonggang Huang
Department of Civil and Environmental Engineering, Mechanical Engineering, Materials Science and Engineering
Northwestern University
Evanston, IL 60208, USA

Prof. Xue Feng
AML, Department of Engineering Mechanics, Center for Mechanics and Materials
Tsinghua University
Beijing 100084, China

Prof. J. A. Rogers
Center for Bio-Integrated Electronics
Departments of Materials Science and Engineering, Biomedical Engineering, Chemistry, Mechanical Engineering, Electrical Engineering and Computer Science, and Neurological Surgery
Simpson Querrey Institute for Nano/biotechnology, McCormick School of Engineering and Feinberg School of Medicine
Northwestern University
Evanston, IL 60208, USA

†These authors contributed equally to this work

*To whom correspondence should be addressed. E-mail: jrogers@northwestern.edu

	PBS	HBSS	Bovine growth serum*	Artificial Perspiration
pH	7.2-7.4	8.3 (CO_2 sensitive)	7.3-7.5	4.3-4.7
NaCl	138 mM (8 g/L)	138 mM	Na: 130 mEq/L K: 15.6 mEq/L P: 0.078 g/L	20 g/L
KCl	2.7 mM	5.3 mM		-
Na_2HPO_4	10 mM (1.4g/L)	0.3 mM		-
KH_2PO_4	1.8 mM	0.44 mM		-
Glucose	-	5.6 mM (1 g/L)	1.01 g/L	-
$NaHCO_3$	-	4 mM (0.35 g/L)		-
$CaCl_2$	-	1.26 mM (0.14g/L)	Ca: 0.075 g/L	-
$MgSO_4$ $7H_2O$	-	0.41 mM		-
$MgCl_2$ $6H_2O$	-	0.5 mM		-
NH_4Cl	-	-		17.5 g/L
Urea (NH_2CONH_2)	-	-	0.07 g/L	5 g/L
Acetic acid	-	-		2.5 g/L
Racemic lactic acid ($CH_3CH(OH)COOH$)	-	-		15 g/L
Total protein	-	-	56 g/L (albumin: 32 g/L)	-
Others		Pheonol red (pH indicator) 0.03mM (0.01g/L)		

*from certificate analysis from RMBIO

Table S1. Chemical composition of simulated biofluids

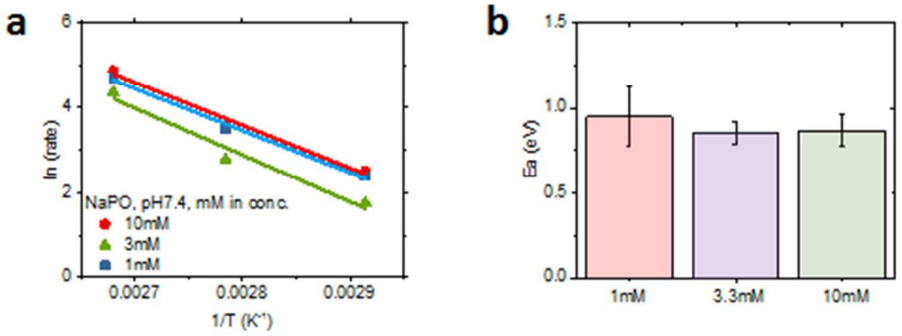

Fig S1. Dissolution rates in 1,3,10mM NaPO solutions

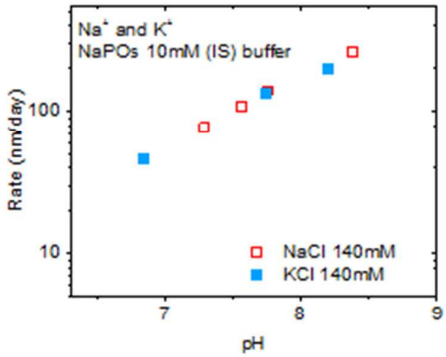

Fig S2. Dissolution rates in NaCl, KCl solutions

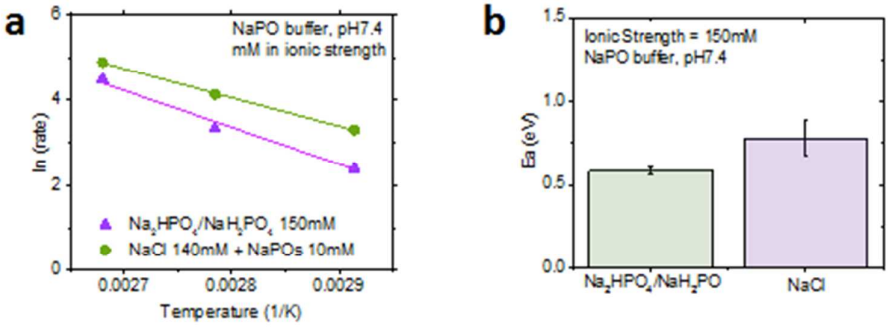

Fig S3. Dissolution rates in 150mM IS NaCl, and NaPO solutions