

# Investigation on the direct precipitation for a continuous synthesis of nano-iron phosphate with high purity

Tongbao Zhang, Dawei Xin, Yangcheng Lu<sup>\*</sup>, Guangsheng Luo

Department of Chemical Engineering, State Key Laboratory of Chemical Engineering, Tsinghua University,

Beijing 100084, China

<sup>\*</sup> To whom any correspondence should be addressed. Tel: +86 10 62773017; Fax: +86 10 62770304. Email address: [luyc@tsinghua.edu.cn](mailto:luyc@tsinghua.edu.cn)

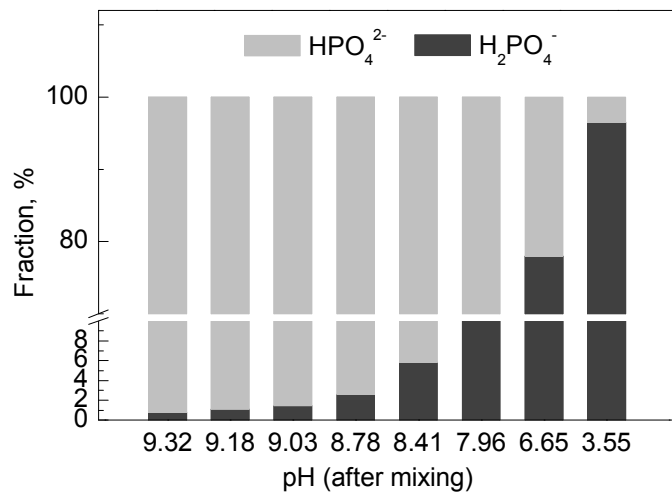


Figure S1. The fraction of phosphate ions at various pH value.

Table S1. The P/Fe in products obtained with varied feeds at 80 °C.

$C_{Fe}/C_P$ in Feed 1	P/Fe in products			
	$C_{Fe}(C_P)=0.05$ mol/L	$C_{Fe}(C_P)=0.1$ mol/L	$C_{Fe}(C_P)=0.2$ mol/L	$C_{Fe}(C_P)=0.3$ mol/L
1:0.0	0.88	0.92	0.96	1.01
1:0.1	0.93	0.97	1.02	1.04
1:0.2	0.96	1.00	1.04	1.12
1:0.3	0.99	1.01	1.08	1.17
1:0.4	-	1.04	-	-
1:0.5	1.02	1.05	1.17	1.19
1:1.0	1.08	1.10	1.17	1.19
1:20	-	1.15	-	-

Table S2. The initial pH value of various Feed 1 at 80°C.

$C_{Fe}/C_P$ in Feed 1	The initial pH value of Feed 1			
	$C_{Fe}(C_P)=0.05$ mol/L	$C_{Fe}(C_P)=0.1$ mol/L	$C_{Fe}(C_P)=0.2$ mol/L	$C_{Fe}(C_P)=0.3$ mol/L
1:0.0	1.81	1.57	1.13	0.94
1:0.1	1.73	1.35	0.81	0.57
1:0.2	1.59	1.22	0.61	0.38
1:0.3	1.5	1.05	0.48	0.23
1:0.4	-	0.97	-	-
1:0.5	1.29	0.93	0.32	0.12
1:1.0	-	0.80	-	-
1:2.0	-	0.74	-	-

Table S3. The pH value of mixed solutions at 80°C.

$C_{Fe}/C_P$ in Feed 1	The pH value of mixed solutions			
	$C_{Fe}(C_P)=0.05$ mol/L	$C_{Fe}(C_P)=0.1$ mol/L	$C_{Fe}(C_P)=0.2$ mol/L	$C_{Fe}(C_P)=0.3$ mol/L
1:0.0	9.12	9.32	9.26	9.32
1:0.1	8.96	9.18	9.18	9.22
1:0.2	8.82	9.02	9.03	9.06
1:0.3	8.71	8.76	8.78	8.82
1:0.4	-	8.41	-	-
1:0.5	7.9	7.96	7.9	7.96
1:1.0	-	6.65	-	-
1:2.0	-	3.55	-	-