Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting information for:

Reason for the deactivation of SnO$_x$ in acetylene hydrochlorination

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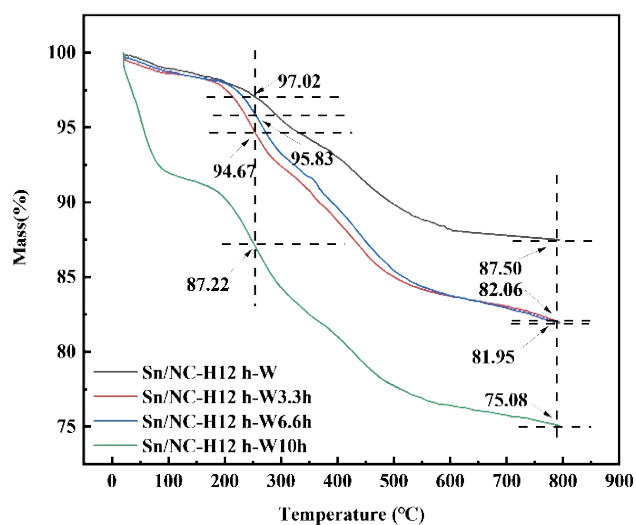# Content

1. **Figures**

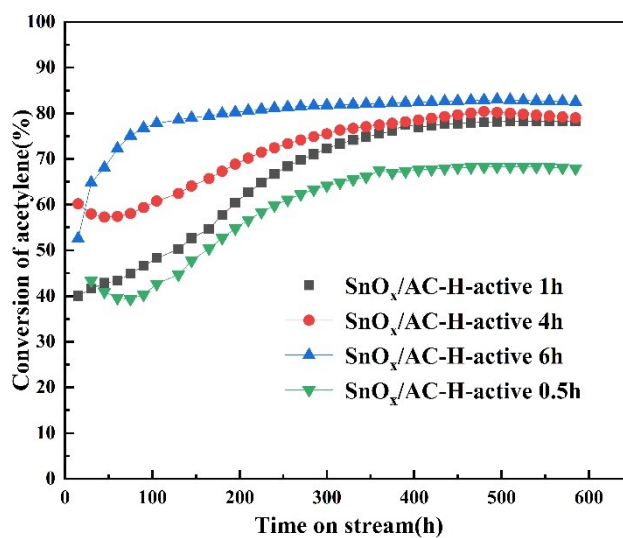**Fig. S1 N$_2$-TG of SnO$_x$/NC- H-W with different washing times.**

Fig. S2 Catalytic performance under different HCl activation times of SnO$_x$/NC- H.

2. Tables

Table S1 XPS element analysis with different reaction time

Sample	Sn(wt%)	C(wt%)	Cl(wt%)	O(wt%)	N(wt%)
SnO$_x$/AC-H-fresh	6.55	67.58	1.56	22.67	1.65
SnO$_x$/AC-H-2	4.67	72.69	1.72	19.42	1.51
SnO$_x$/AC-H-4	4.22	76.15	2.27	15.62	1.73
SnO$_x$/AC-H-6	4.17	75.63	4.02	14.42	1.76

Table S2 The Sn content of the SnO$_x$/NC-H of different times

Sample	Sn(wt%)
SnO$_x$/AC-H-fresh	13.92%
SnO$_x$/AC-H-2	10.74%
SnO$_x$/AC-H-4	8.54%
SnO$_x$/AC-H-6	5.91%
SnO$_x$/AC-H-12	4.01%

Table S3 ICP results of catalyst

Sample	Sn(wt.%)

SnO_x/AC-fresh	3.5%
SnO_x/AC-used	2.4%
SnO_x/AC-HCl	2.3%
SnO_x-VC/AC-fresh	4.8%
SnO_x-VC/AC-used	2.9%
SnO_x-VC /AC-HCl	2.8%