

**Table S1:** The acid sites of AISMSN catalysts

Catalysts	Acid sites (mmol/g)				
	$n_{Si}/n_{Al}$ <sup>a</sup>	Weak (393-623K)	Medium (623-723)	Strong (>723K)	Total (>623K)
AISMSN(AIC)	46	0.553	0.071	0.223	0.294
AISMSN(AIS)	43	0.575	0.075	0.229	0.304
AISMSN(AIN)	41	0.596	0.080	0.230	0.310
AISMSN(AIP)	42	0.588	0.078	0.231	0.309
AISMSN(20)	24	0.747	0.097	0.296	0.393
AISMSN(100)	101	0.534	0.057	0.164	0.221
W-AISMSN(20) <sup>b</sup>	25	0.744	0.097	0.295	0.392

<sup>a</sup>  $n_{Si}/n_{Al}$  ratios of products are determined by ICP-AES

<sup>b</sup> The catalyst was washed using ammonium chloride solution for the removal of non-framework octahedral aluminum species

**Table S2:** Comparison of the catalytic activity of *tert*-butylation of phenol over W-AISMSN(20) with other mesoporous catalysts (Time-on stream = 1 h).

Reaction conditions/product details	W-AISMSN(20) (our work)	GaSBA-1(17) (Ref. 22)	FeAlMCM-41 (20) (Ref. 22)	AlMCM-41 (56) (Ref.21)	FeMCM-41 (50) (Ref.21)	FeSBA-1(36) (Ref.22)
Weight of catalyst /mg	500	500	500	750	750	500
$N_{BuOH}/n_{phenol}$	2	3	3	2	2	3
WHSV ( $h^{-1}$ )	4.86	5.1	5.1	4.8	4.8	4.9
reaction temperature ( $^{\circ}C$ )	450K	448	473	448	448	473
Phenol conversion (%)	90.4	84.0	70.1	35.9	21.1	78.5
2-TBP selectivity (%)	3.0	7.4	10.4	8.1	9.5	14.3
3-TBP selectivity (%)	5.8	-	-	4.7	-	-
4-TBP selectivity (%)	95.4	72.1	75.2	83.4	87	71.2
2,4-TBP selectivity (%)	1.6	20.5	14.4	3.9	3.5	11.4