Supporting information

# Indoor air purification using activated carbon adsorbers: regeneration using catalytic combustion of intermediately stored VOC

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**Table S1:** Mass balance of adsorption and desorption cycles

**Triethylamine**

| AC 500 mg | Cycle | Total weight [g] | Load [g] | Reg. [g] | AC Loss [mg] | AC Loss [%] | Ads. Cap. [%] | Recovery [mg] | Recovery [%] |
|---|---|---|---|---|---|---|---|---|---|
| Start | 0 | 22.12833 | | | | | | | |
| Load | 1 | 22.27794 | 0.14961 | | | | **29.9** | | |
| Reg. | 1 | 22.13184 | | -0.1461 | **-3.51** | **-0.7** | | **149.61** | **100** |
| Load | 2 | 22.28177 | 0.14993 | | | | **29.8** | | |
| Reg. | 2 | 22.14274 | | -0.13903 | **-10.9** | **-2.2** | | **149.93** | **100** |
| Load | 3 | 22.2856 | 0.14286 | | | | **27.8** | | |
| Reg. | 3 | 22.14325 | | -0.14235 | **-0.51** | **-0.1** | | **142.86** | **100** |
| Load | 4 | 22.28377 | 0.14052 | | | | **27.3** | | |
| Reg. | 4 | 22.145 | | -0.13877 | **-1.75** | **-0.3** | | **140.52** | **100** |

***n*-Decane**

| AC 250 mg | Cycle | Total weight [g] | Load [g] | Reg. [g] | AC Loss [mg] | AC Loss [%] | Ads. Cap. [%] | Recovery [mg] | Recovery [%] |
|---|---|---|---|---|---|---|---|---|---|
| Start | 0 | 22.2562 | | | | | | | |
| Load | 1 | 22.34555 | 0.08935 | | | | **35.7** | | |
| Reg. | 1 | 22.24802 | | -0.09753 | **8.18** | **3.3** | | **89.35** | **100** |
| Load | 2 | 22.34247 | 0.09445 | | | | **39.1** | | |
| Reg. | 2 | 22.2424 | | -0.10007 | **5.62** | **2.3** | | **94.45** | **100** |
| Load | 3 | 22.33286 | 0.09046 | | | | **38.3** | | |
| Reg. | 3 | 22.21632 | | -0.11654 | **26.08** | **11.0** | | **90.46** | **100** |
| Load | 4 | 22.3004 | 0.08408 | | | | **40.0** | | |
| Reg. | 4 | 22.19747 | | -0.10293 | **18.85** | **9.0** | | **84.08** | **100** |

**Limonene**

| AC 250 mg | Cycle | Total weight [g] | Load [g] | Reg. [g] | AC Loss [mg] | AC Loss [%] | Ads. Cap. [%] | Recovery [mg] | Recovery [%] |
|---|---|---|---|---|---|---|---|---|---|
| Start | 0 | 21.95185 | | | | | | | |
| Load | 1 | 22.05045 | 0.0986 | | | | **39.4** | | |
| Reg. | 1 | 21.94892 | | -0.10153 | **2.93** | **1.2** | | **98.6** | **100** |
| Load | 2 | 22.0436 | 0.09468 | | | | **38.3** | | |
| Reg. | 2 | 21.934 | | -0.1096 | **14.92** | **6.0** | | **94.68** | **100** |
| Load | 3 | 22.0249 | 0.0909 | | | | **39.2** | | |
| Reg. | 3 | 21.9094 | | -0.1155 | **24.6** | **10.6** | | **90.9** | **100** |
| Load | 4 | 21.9834 | 0.074 | | | | **35.7** | | |
| Reg. | 4 | 21.864 | | -0.1194 | **45.4** | **21.9** | | **74** | **100** |

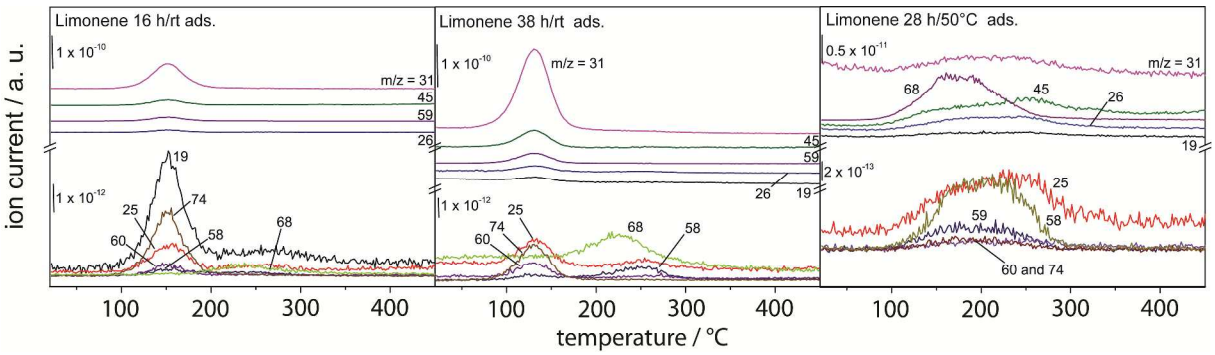


**Figure S1:** Additional masses found for limonene during desorption.

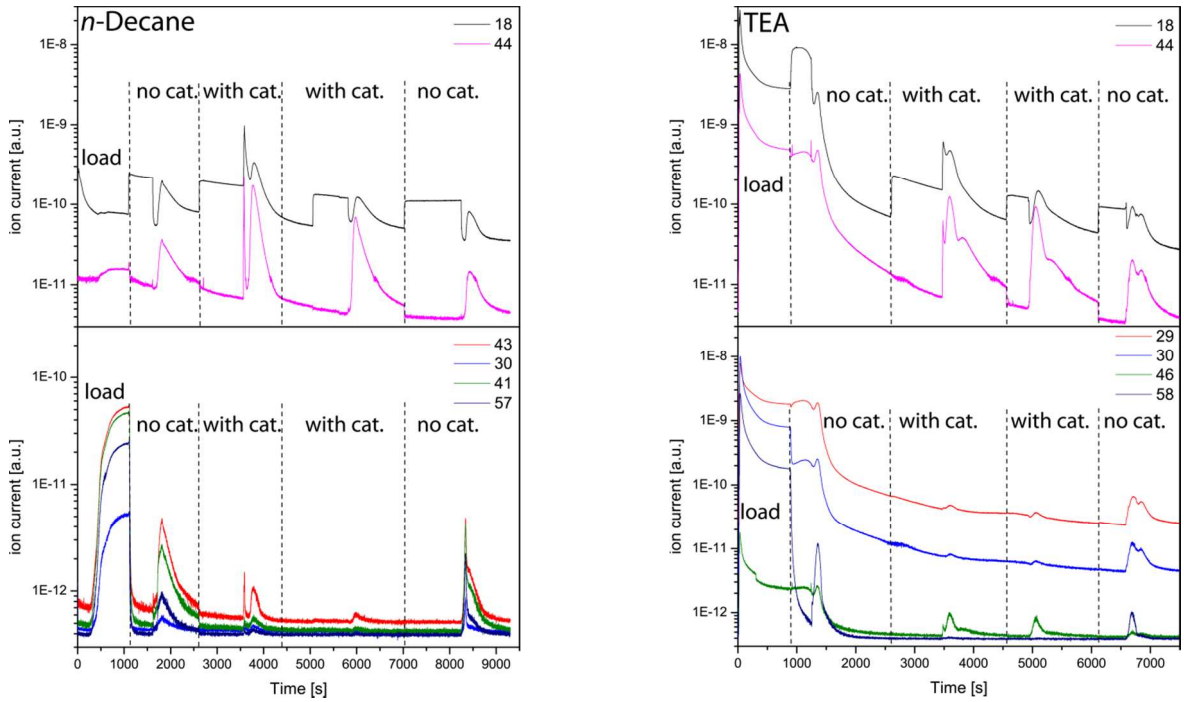


**Figure S2:** Desorption and combustion cycles for *n*-decane and TEA.

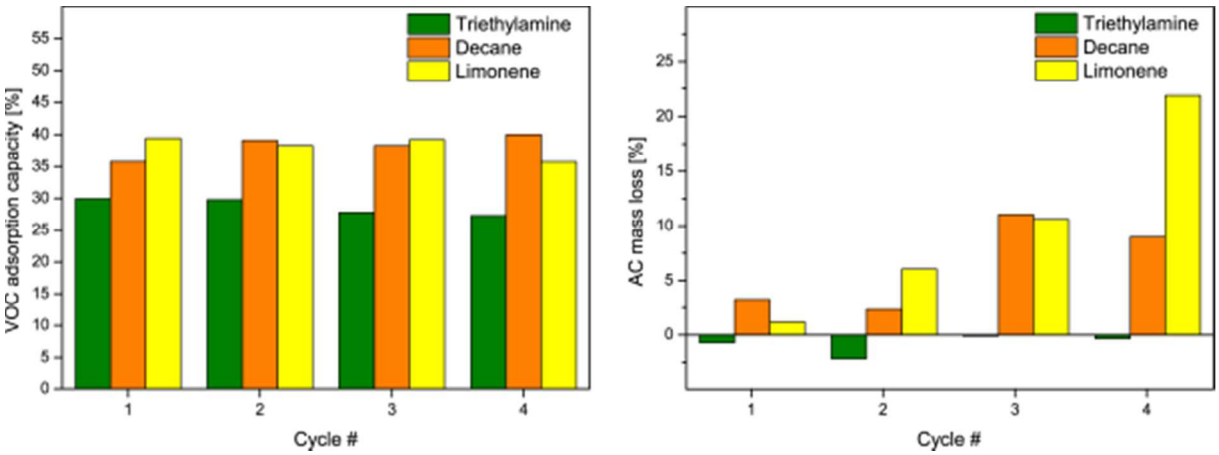


**Figure S3:** Mass balance of adsorption and regeneration cycles for TEA, *n*-decane and limonene on AP4-60 granules (200 – 400 µm). Left: VOC adsorption capacity, right: AC mass loss after each cycle.

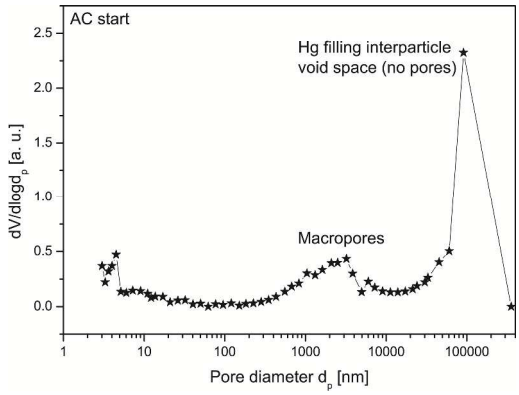


**Figure S4:** Hg intrusion porosimetry of starting material.