**Table SM.5.2.** Advantages and disadvantages of mass spectrometry techniques and selected array-based sensors

Source: Queralto et al. (2014)

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| Technology | Advantages | Disadvantages |
| Mass spectrometry-based techniques | Ability to detect cancer-specific Volatile organic compounds; highly standardized techniques; compatible with pre-concentration technique, such as solid phase micro extraction (SPME) and needle trap micro extraction methods to further improve the sensitivity | Expensive; require a skilled operator; long analysis time |
| Array-based sensors | Cheap, portable, fast, and potential to detect Volatile organic compounds at low concentrations | Cannot identify cancer-specific Volatile organic compounds. Sensor training and standardization  are required. Breath Volatile organic compound fingerprints  depend on sensor type. |
| 1. Quartz crystal  microbalance (QCM) | High precision and sensitivity, diverse range of sensor coatings available | Poor signal-to-noise ratio, sensitivity to humidity and temperature, complex circuitry |
| 2. Au*/*Pt nanoparticles | Fast response to a diverse set of analytes | Sensitive to humidity |
| 3. Carbon nanotube (CNT)-based sensor | Fast response time, reversible | Sensitive to humidity, less response  to saturated hydrocarbons |
| 4. Conducting polymer | Sensitive to various Volatile organic compounds; fast response time | Sensitive to humidity and temperature, poor sensor life  Composite |
| 5. Colorimetric sensor | High sensitivity and selectivity high dimensionality; limited humidity effect | Sensor is non-reversible (disposable); for  array hydrocarbons, pre-oxidation is required for high  sensitivity |