Development of nanostructured protective "sight glasses" for IR gas sensors

In this work protective "sight glasses" for infrared gas sensors showing a sub-wavelength nanostructure with random patterns have been fabricated by reactive ion etching (RIE) in an easy and comparable cheap single step mask-less process. By an organic coating, the intrinsic water repellent property of the surface could be enhanced, shown by contact angle and roll-off angle measurements. The "self-cleaning" surface property and chemical robustness towards aggressive environments are demonstrated. FT-IR spectroscopy concerning the optical properties of these nanostructured silicon windows revealed a stable anti-reflective "moth-eye" effect in certain wavelength ranges owing to the nanostructures.

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