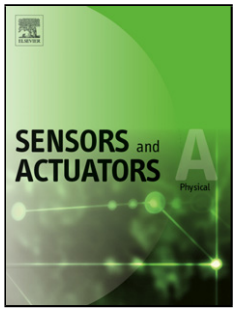

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Tunable wrinkled graphene foams for highly reliable piezoresistive sensor

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Highlights

- Wrinkled graphene foams is prepared with a simple and novel method.
- The piezoresistive pressure sensor based on wrinkled graphene foams exhibits a reliable stability (>10^5 cycles).
- The piezoresistive pressure sensor shows short response time（0.2 s） and low relaxation time (0.15 s)
- The sensor demonstrates good performances in various applications, such as pulse detection, voice recognition as well as the finger joints movement.

The rapid development of flexible electronics and artificial intelligence brings an urgent demand for high-performance flexible pressure sensors. In this paper, a method is proposed to prepare wrinkled graphene foam by freeze-drying and post-annealing method, where zinc chloride is used to tune structure. A piezoresistive pressure sensor based on the wrinkled graphene foam is assembled. Benefiting from the unique contact interface of wrinkled microstructures, as well as the mechanical strength and the superior resilience of the foam structure, the piezoresistive pressure sensor exhibits a reliable stability (>10^5 cycles), short response time（150 ms）and low relaxation time