Development of environment-friendly integration processes

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Abstract

We examine methods to control bonding strength and select bonding processes suitable for integration of MEMS and various devices.

Introduction

Bonding technology for integration of various advanced devices

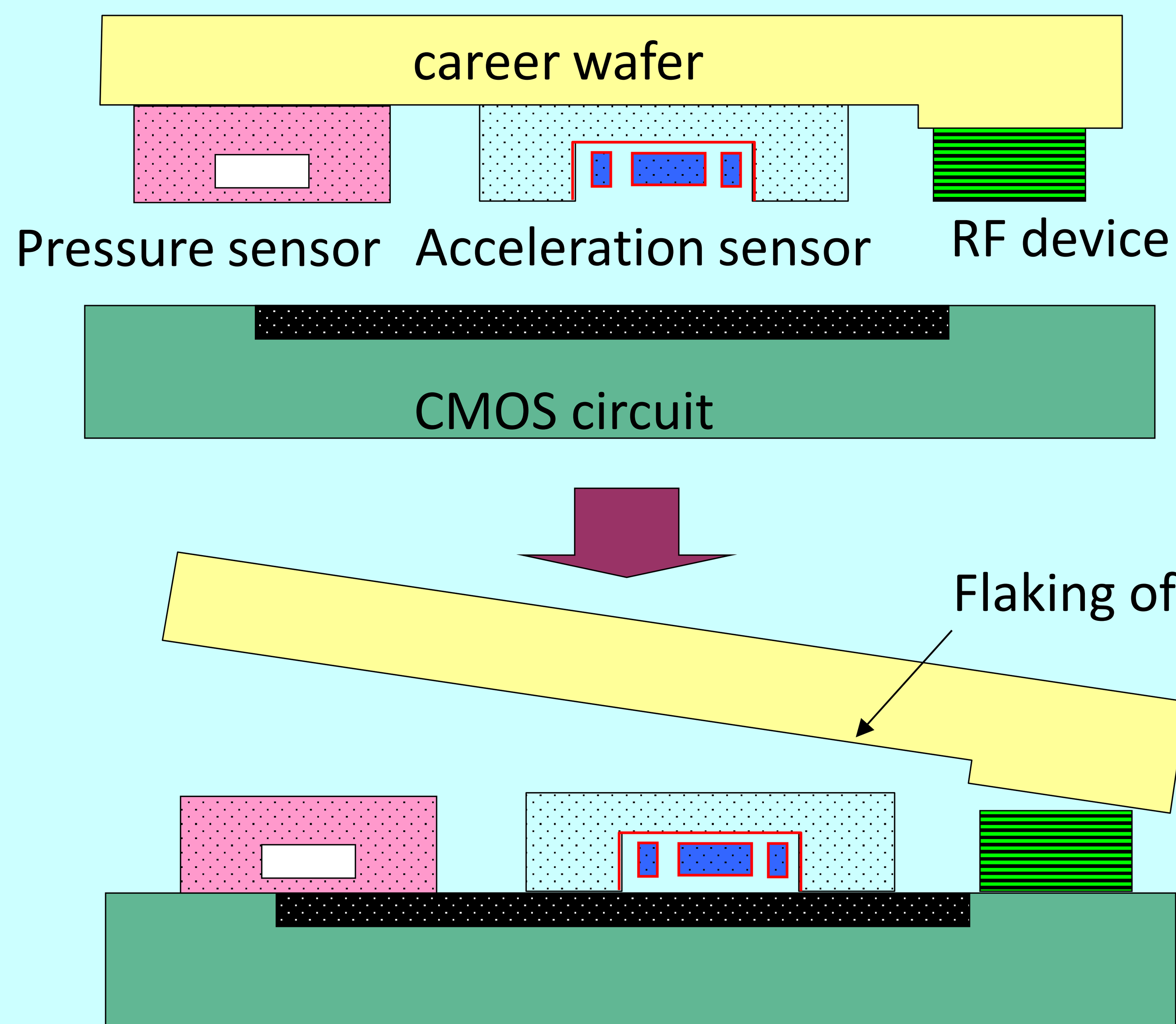

Fig. 1. Schematic of the bonding method for device integration

Methods

Ⅰ. Bonding condition controlled by the surface-roughness in a conventional wafer direct bonding method.

Ⅱ. Select a technique capable of bonding flexibly various heterogeneous devices of different chip-sizes, materials, etc.

Ⅲ. Low temperature (< 250 ℃) bonding method compatible with the functional layer

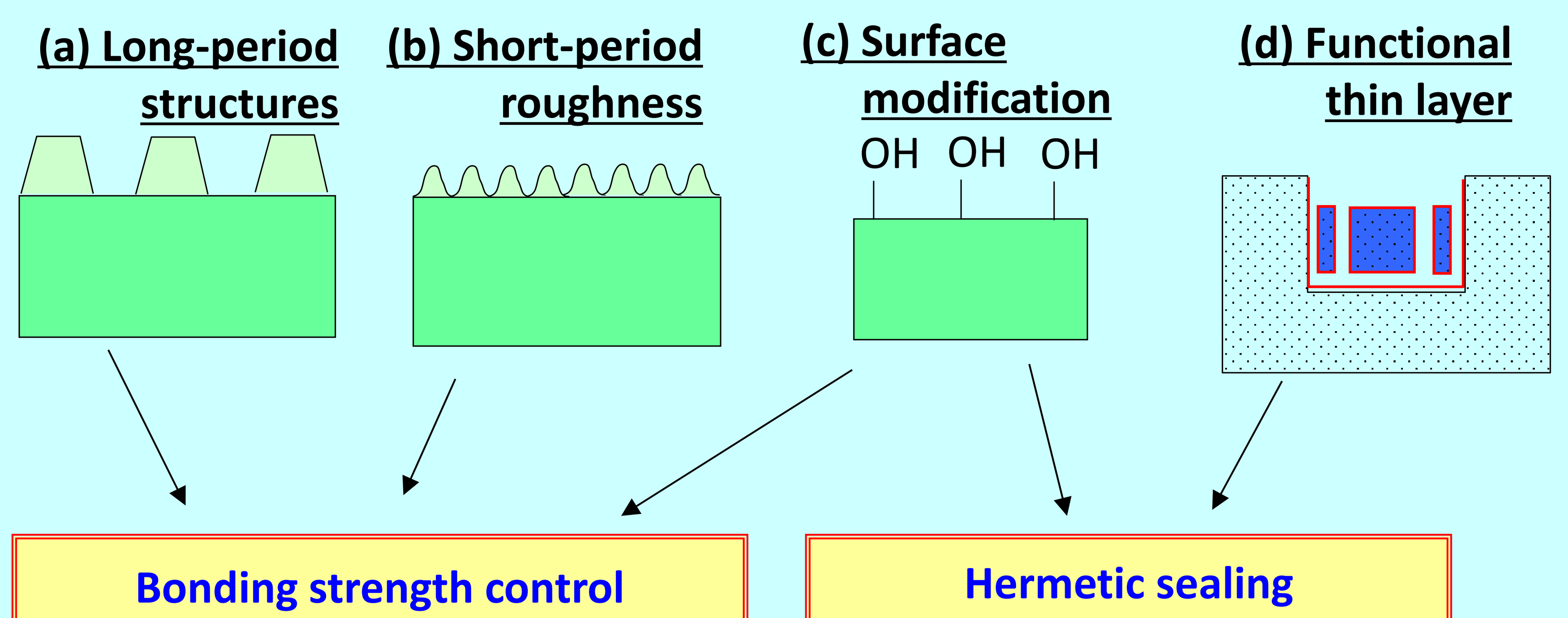

Fig. 2. Schematic of the control bonding conditions

Experimental Results

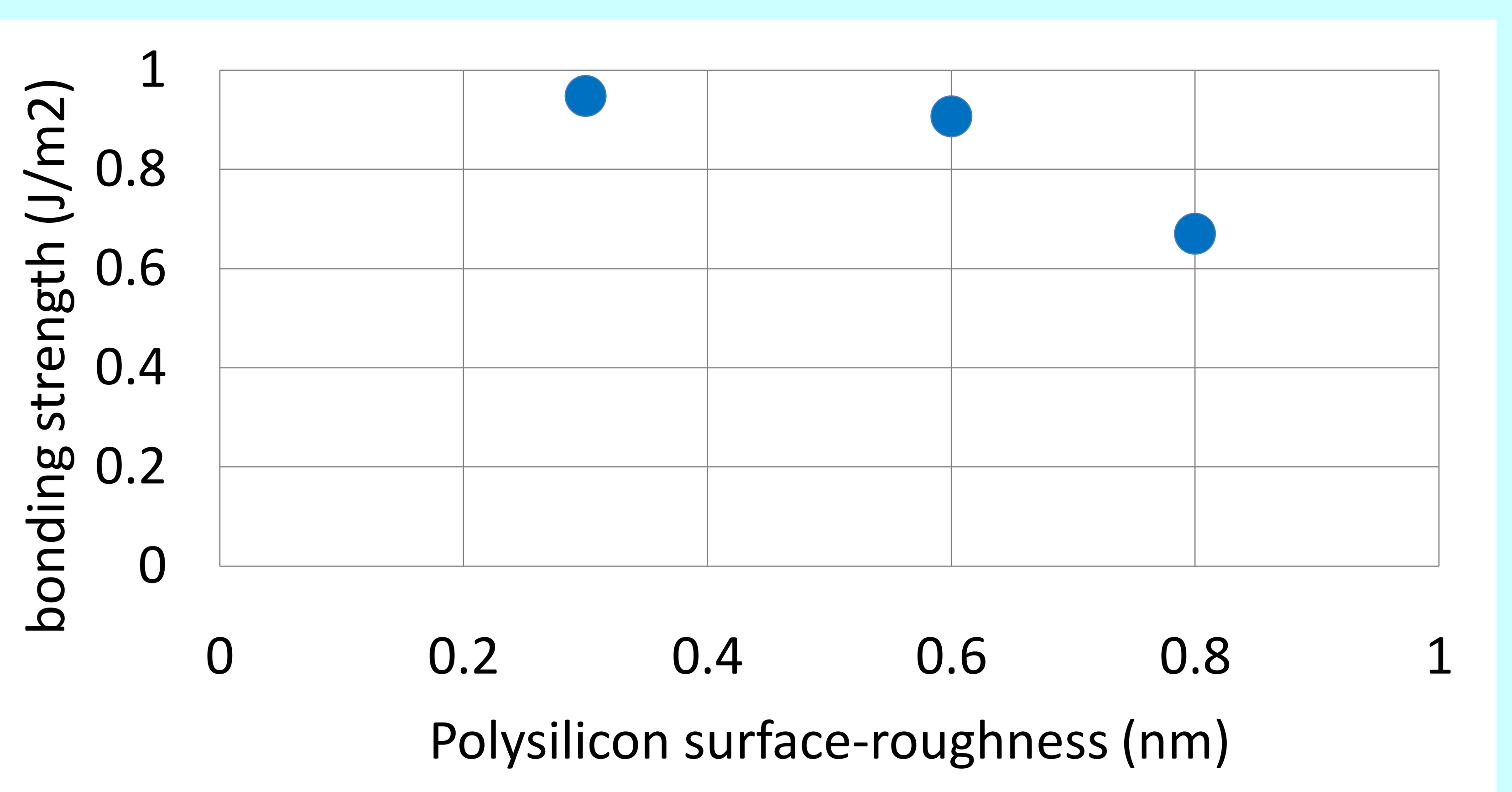

Fig. 3. Relationship between the roughness of polysilicon and bonding strength

Summary

(i) Bonding strength could be controlled by changing surface roughness.

(ii) The effects of a variety of patterns on bonding surface is now under examination.

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