RSC Advances (Electronic Supplementary Information)

Capsule-free fluid delivery and beam-induced electrodeposition in a scanning electron microscope

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Nanocapillary Mounting

The mounting of the nanocapillary (NC) to a threaded rod was accomplished by using two stainless steel collars as in Figure S1 where the outer collar is threaded and the inner collar provides a surface on which a silicon seal can be compressed. The silicone seal surrounds the end of the glass NC. As the outer collar is tightened onto the threaded rod, the silicone seal is compressed, the forces generated on the end hold the NC in place without breaking the delicate glass.

Nanocapillary Vacuum Sealing

The backside of the nanocapillary (NC) will be exposed to vacuum if not properly sealed. This will result in all liquid being quickly evacuated through the large diameter backside of the NC and

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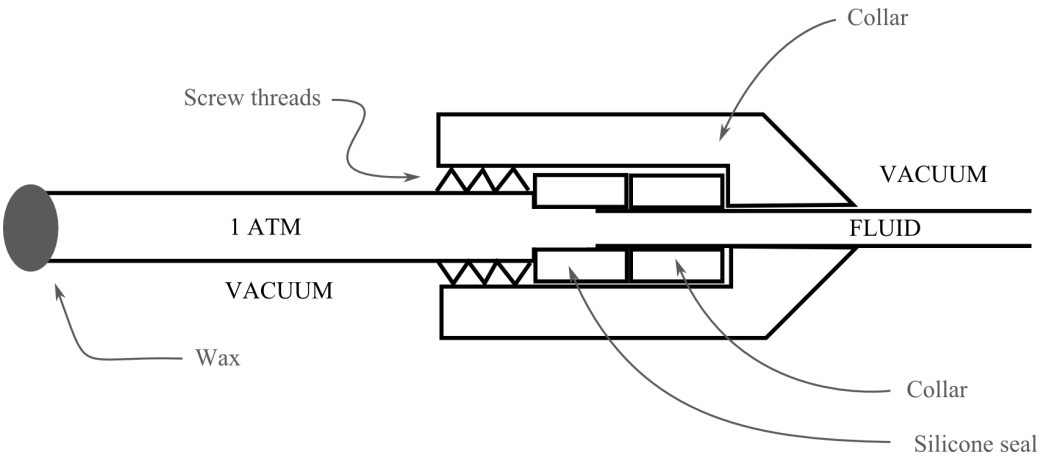

Figure S1: Illustration of the clamping and sealing mechanisms to mount a nanocapillary to a threaded rod. The backside wax seal provides a vacuum seal to prevent liquid from being pumped out of the large diameter end of the NC.

rapid drying out of the NC. To ensure the backside is leak tight, a method of sealing was developed that utilizes low vapor pressure, highly inert, vacuum compatible wax. A small piece of Apiezon Wax W (Structure Probe Inc. Supplies Part Number 05121A-AB) was heated on a hot plate to approximately 80°C (or until a highly viscous liquid was formed). The backside of the NC was then briefly dipped into the liquified wax followed by room temperature cooling and solidification of the wax resulting in a wax seal as illustrated in Figure S1. Subseqent experiments of placing the wax-sealed NC in vacuum showed that the method was effective at creating a vacuum-tight seal through which there was negligible liquid loss.