# Effect of a homogeneous magnetic field on the electrospraying characteristics of sulfolane ferrofluids

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(Received 21 May 2016; Revised 31 Jan 2017; accepted … )

**AUXILIARY MATERIAL**

The table below collects relevant data relating to the minimum flow rate at the edge of stability. *H* is the applied magnetization. *Vvial* is the high voltage applied to the ferrofluid reservoir. *Vdrop* is the calculated voltage drop associated to transmitted current through the bulk resistance of the line. For each magnetization and applied voltage, a set of emission destabilizations is observed and their flow rates and currents at destabilization are recorded. *Qmin* is the average flow rate when the Taylor cone destabilizes. *σQ* is the standard deviation of that set of flow rates. *Imin* is the average emitted current when the Taylor cone destabilizes; *σI* is the standard deviation of that set of currents. *Dmin* is the calculated droplet size based on the mean drop charge density I/Q snf the assumption that it is charged at 44% of the Rayleigh limit; *σD* is the standard deviation of the set of *Dmin* diameters.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | H (A/m) | Vvial (Volt) | Vdrop (Volt) | Qmin (pL/s) | σQ (pL/s) | Imin (nA) | σI (nA) | Dmin (nm) | σD (nm) |
| A | 0 | 1250 | 177 | 156 | 11.7 | 142 | 5.9 | 30.7 | 0.7 |
| A | 0 | 1200 | 168 | 152 | 5.7 | 135 | 2.8 | 31.2 | 0.3 |
| A | 0 | 1150 | 153 | 128 | 3.2 | 123 | 1.0 | 29.5 | 0.4 |
| A | 0 | 1100 | 135 | 101 | 3.1 | 108 | 3.5 | 27.4 | 0.1 |
| A | 23,490 | 1250 | 164 | 135 | 4.3 | 131 | 2.9 | 29.4 | 0.8 |
| A | 23,490 | 1200 | 154 | 120 | 2.8 | 123 | 2.0 | 28.2 | 0.4 |
| A | 23,490 | 1150 | 141 | 106 | 2.2 | 113 | 1.5 | 27.5 | 0.4 |
| A | 23,490 | 1100 | 133 | 94 | 1.5 | 106 | 2.9 | 26.5 | 0.5 |
| A | 23,490 | 1050 | 128 | 81 | 1.8 | 102 | 4.1 | 24.6 | 0.8 |
| A | 23,490 | 1000 | 125 | 72 | 2.4 | 100 | 2.4 | 23.1 | 0.4 |
| A | 23,490 | 950 | 128 | 71 | 1.8 | 102 | 6.2 | 22.5 | 0.5 |
| B | 0 | 2600 | 861 | 1720 | 76.9 | 62 | 0.5 | 265 | 7 |
| B | 0 | 2500 | 748 | 1469 | 49.5 | 53 | 0.4 | 262 | 7 |
| B | 0 | 2400 | 798 | 1812 | 93.0 | 57 | 4.0 | 289 | 10 |
| B | 23,490 | 2500 | 674 | 1115 | 32.1 | 48 | 0.4 | 234 | 5 |
| B | 23,490 | 2400 | 666 | 1055 | 76.0 | 48 | 2.2 | 227 | 4 |
| B | 23,490 | 2300 | 619 | 969 | 11.6 | 44 | 0.4 | 225 | 2 |
| B | 23,490 | 2200 | 611 | 925 | 46.6 | 44 | 1.8 | 220 | 4 |
| B | 23,490 | 2100 | 566 | 937 | 41.6 | 40 | 1.0 | 234 | 6 |
| B | 23,490 | 2000 | 551 | 894 | 25.5 | 39 | 1.2 | 231 | 4 |
| B | 23,490 | 1900 | 485 | 1127 | 77 | 35 | 2.5 | 293 | 1 |

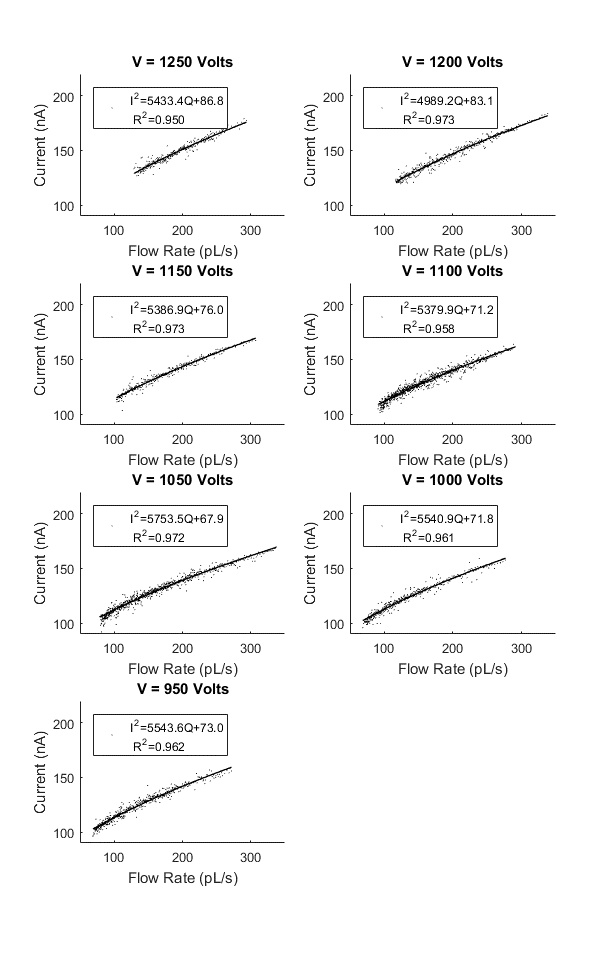


FIGURE SI-1: Full set of current versus flow rate data, linear regression curves (between *I2* and *Q*), fit parameters, and R2 values from figure 4, panel 1 (left). B=295 Gauss

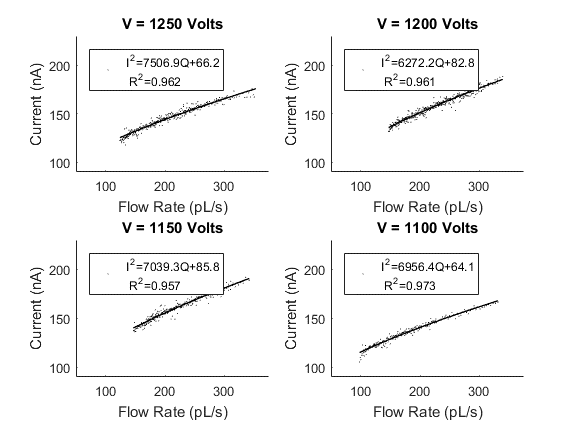


FIGURE SI-2: Full set of current versus flow rate data, linear regression curves (between *I2* and *Q*), fit parameters, and R2 values from figure 4, panel 2 (right). B=0.