

Supplementary Material

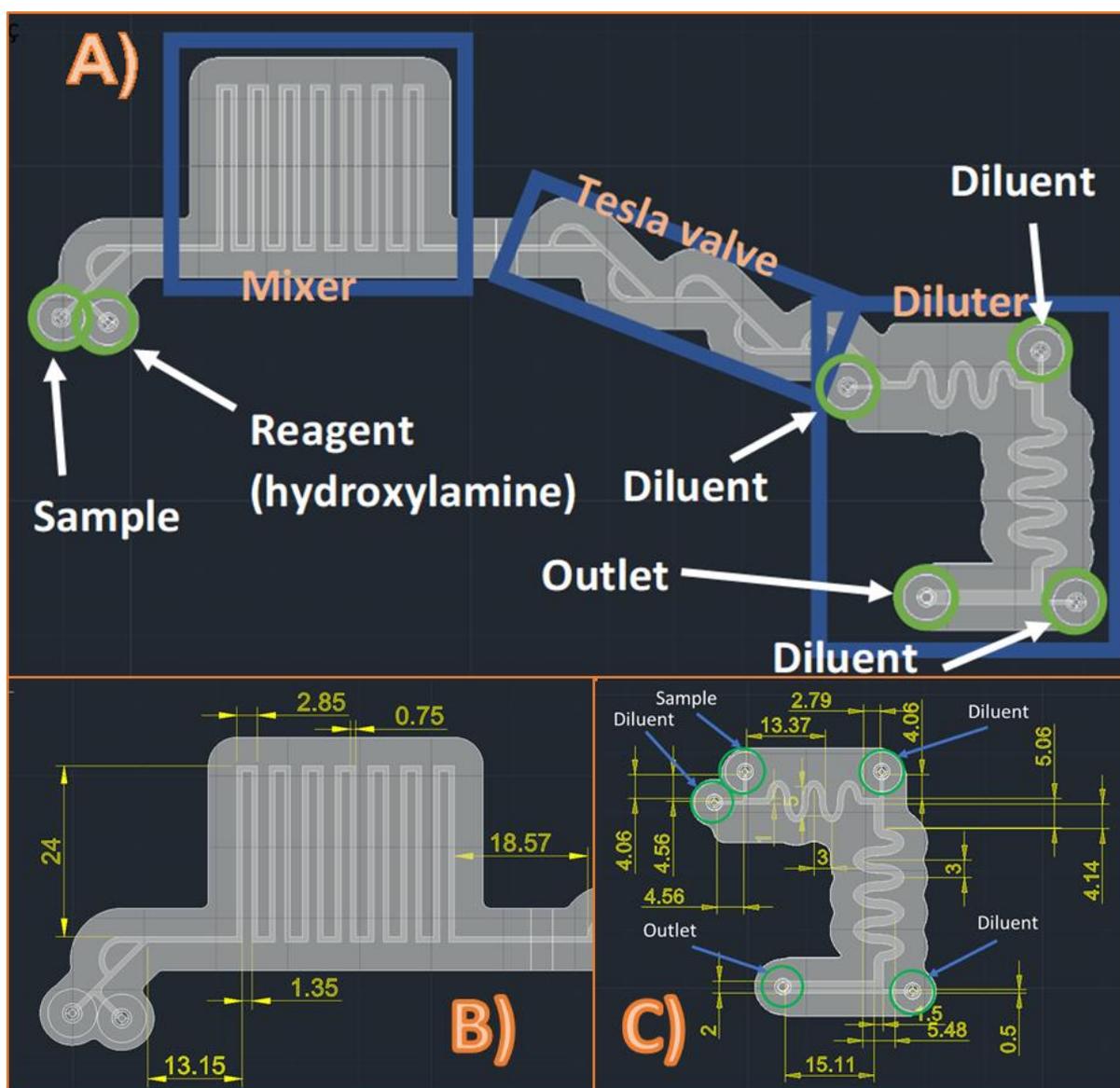
# Microflow Injection System for Efficient Cu(II) Detection Across a Broad Range

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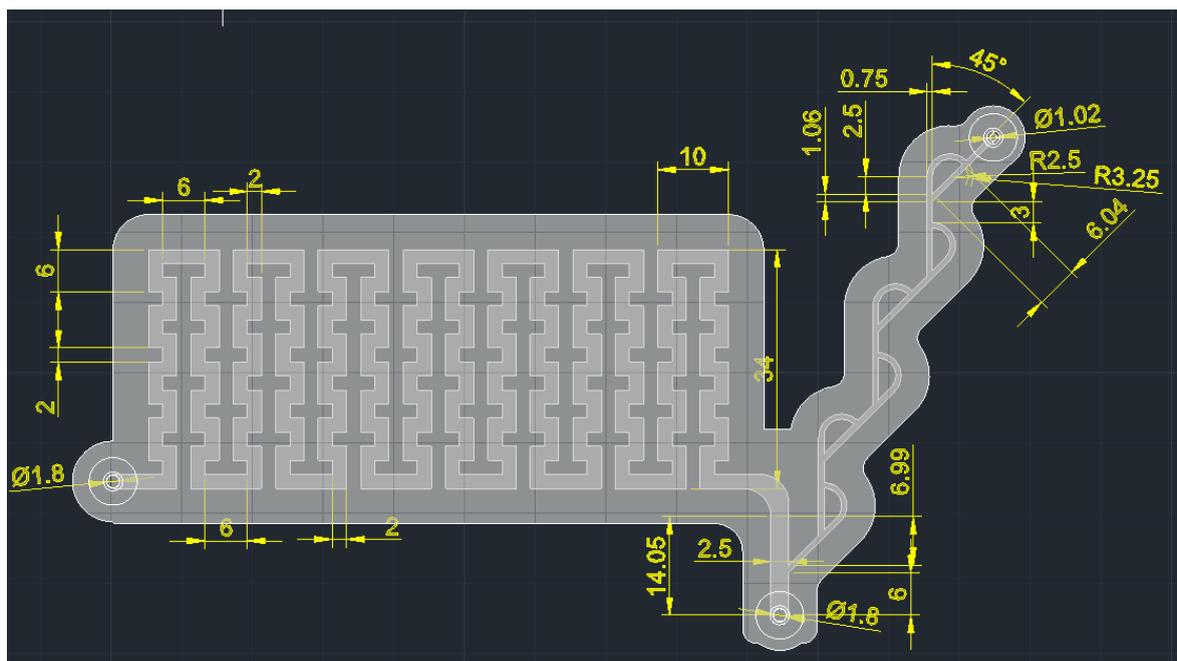
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**Figure S1.** A) CAD of platform 1 formed by a hydroxylamine mixer module connected to a diluter module via a Tesla valve. B) Dimensional labelling of the hydroxylamine mixer with a height of 0.5 mm. C) Dimensional labelling of the diluter [1] with a height of 0.75 mm. The units for dimensions are in millimeters.



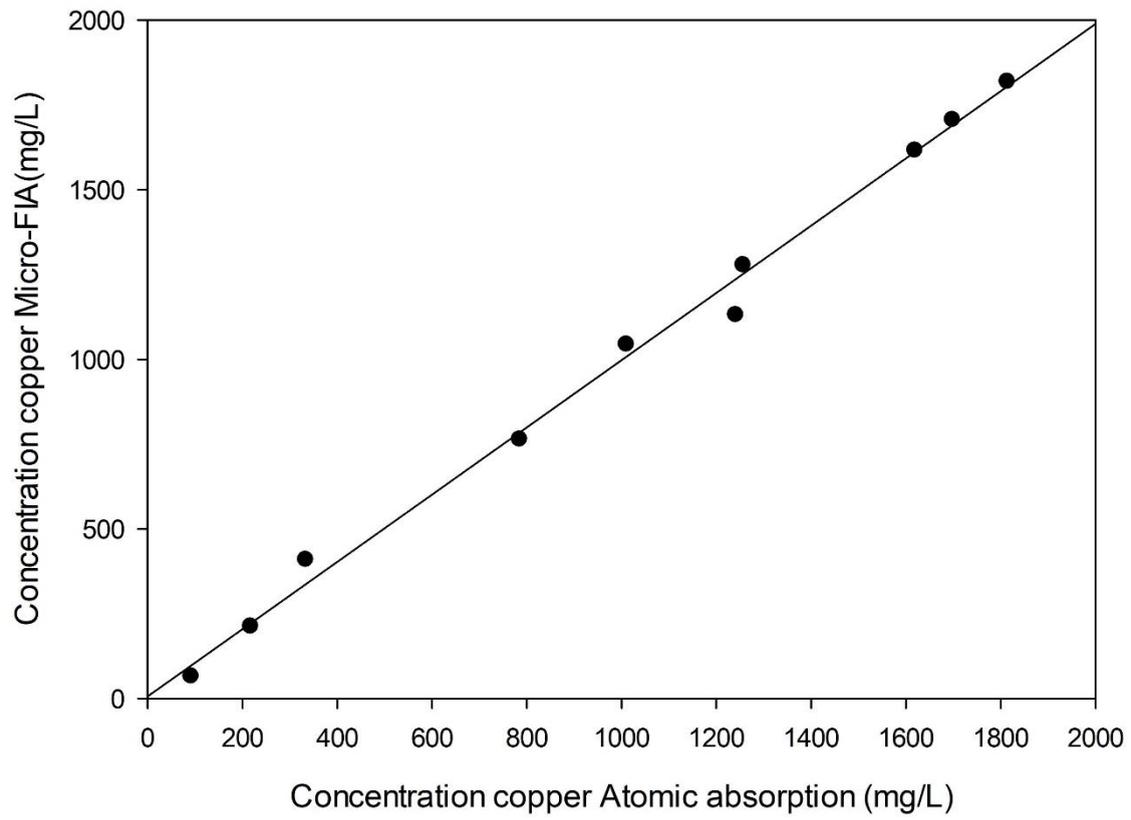
**Figure S2.** Dimensional labeling of the disperser [46] with a height of 1 mm with Tesla valve in CAD The units for dimensions are in millimeters.

**Table S1.** Results of repeatability of the modular micro-FIA system.

Copper concentration (mg L <sup>-1</sup> )	Mean (mg L <sup>-1</sup> )	Standard deviation (mg L <sup>-1</sup> )	CV (%)	Cvh (%)
500	0.5166	0.0017	0.32	6.22
1500	1.584	0.018	1.15	5.32

**Table S2.** Results of reproducibility of the modular micro-FIA system.

Copper concentration (mg L <sup>-1</sup> )	Mean (mg L <sup>-1</sup> )	Standard deviation (mg L <sup>-1</sup> )	CV (%)	Cvh (%)
50	0.046	0.003	7.39	8.88
500	0.391	0.020	5.09	6.28
1000	0.82	0.04	4.23	5.66
1500	1.23	0.05	3.73	5.32
2000	1.56	0.06	3.86	5.10



**Figure S3.** Linear regression test to compare the reference method (atomic absorption) and the proposed micro-FIA analyzer.

**Table S3.** An overview on better reported optical methods for the determination of Cu(II).

Method	Linear range	Material of channels	Reactant	Precision (RSD%)	Accuracy (R%)	Selectivity	Measure frequency (h <sup>-1</sup> )	LoD	LoQ	Reference
UV-vis FIA	0.4-40 mg·L <sup>-1</sup>	Teflon	Neocuproine	2.31	97-104.9	High, not interferences	69	0.1 mg·L <sup>-1</sup>	0.3 mg·L <sup>-1</sup>	[52]
UV-vis FIA UV-vis SIA	1-170 mg·L <sup>-1</sup> 0.01-110 mg·L <sup>-1</sup>	Teflon	Glycine	0.090 0.85	102 100	Do not found interferences	120 100	0.1 mg·L <sup>-1</sup> 0.010 mg·L <sup>-1</sup>	1 mg·L <sup>-1</sup> 0.01 mg·L <sup>-1</sup>	[53]
UV-vis FIA	0.05-8 µg·L <sup>-1</sup>	Teflon	Catalytic effect of Cu(II) on redox with cysteine with Fe(III), and Fe(II) formed reacts with 2,4,6-tris(2-pyridyl)-1,3,5-triazine	0.8-1.6	101	500 mg·L <sup>-1</sup> Fe(III), Hg(II), Cd(II), V(V)	30	0.005 µg·L <sup>-1</sup>	0.05 µg·L <sup>-1</sup>	[54]
UV-vis FIA	1-12 mg·L <sup>-1</sup>	PTFE tubing	4-(2- pyridylazo)resorcinol	0.2-0.9	-	-	-	0.6 mg·L <sup>-1</sup>	0.1 mg·L <sup>-1</sup>	[55]
Amperometric detection FIA	1.6-6.4 mg·L <sup>-1</sup> 0.05-0.35 mg·L <sup>-1</sup>	-	S. cerevisiae 19.3/YEp352-CUP1-lacZ and S. cerevisiae SEY6210/YEp352-CUP1-lacZ	10-15	-	High	0.7	2.1 mg·L <sup>-1</sup> 0.0067 mg·L <sup>-1</sup>	3.2 mg·L <sup>-1</sup> 0.097 mg·L <sup>-1</sup>	[56]
UV-vis FIA	5-120 µg·L <sup>-1</sup>	Stainless-steel	acetylsalicylhydroxamic acid	0.64	99	Fe(III) and Cr(III) has a negligible effect	80	1 µg·L <sup>-1</sup>	5 µg·L <sup>-1</sup>	[57]
Catalytic Photometric FIA	0.05-5 µg·L <sup>-1</sup>	Teflon	Oxidation coupling of p-anisidine with N,N-dimethylaniline in the presence of hydrogen peroxide to form a dye	0.46-0.96	99	Only diphosphate has important effect	30	0.01 µg·L <sup>-1</sup>	0.05 µg·L <sup>-1</sup>	[58]
UV-vis FIA	-	Teflon	1,5-diphenylcarba	< 2	-	-	120	1.41 µg·L <sup>-1</sup>	-	[59]

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<b>UV-vis FIA</b>	34-2000 mg·L <sup>-1</sup>	PLA and PVC	Neocuproine	0.3 - 1.1	101± 2	High, not interferences	7	9 mg·L <sup>-1</sup>	34 mg·L <sup>-1</sup>	This work
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