Greying Testing

Accelerated redeposition testing: methods, chances, limits

Tom Hilgers

Last IDC (2009) we presented the wfk Greying Swatch for accelerated redeposition testing.

We also presented first results comparing the Greying Swatch against other systems.

Project

Our answer:

GRAYING SWATCH
for 5 to 10 cycles

Application

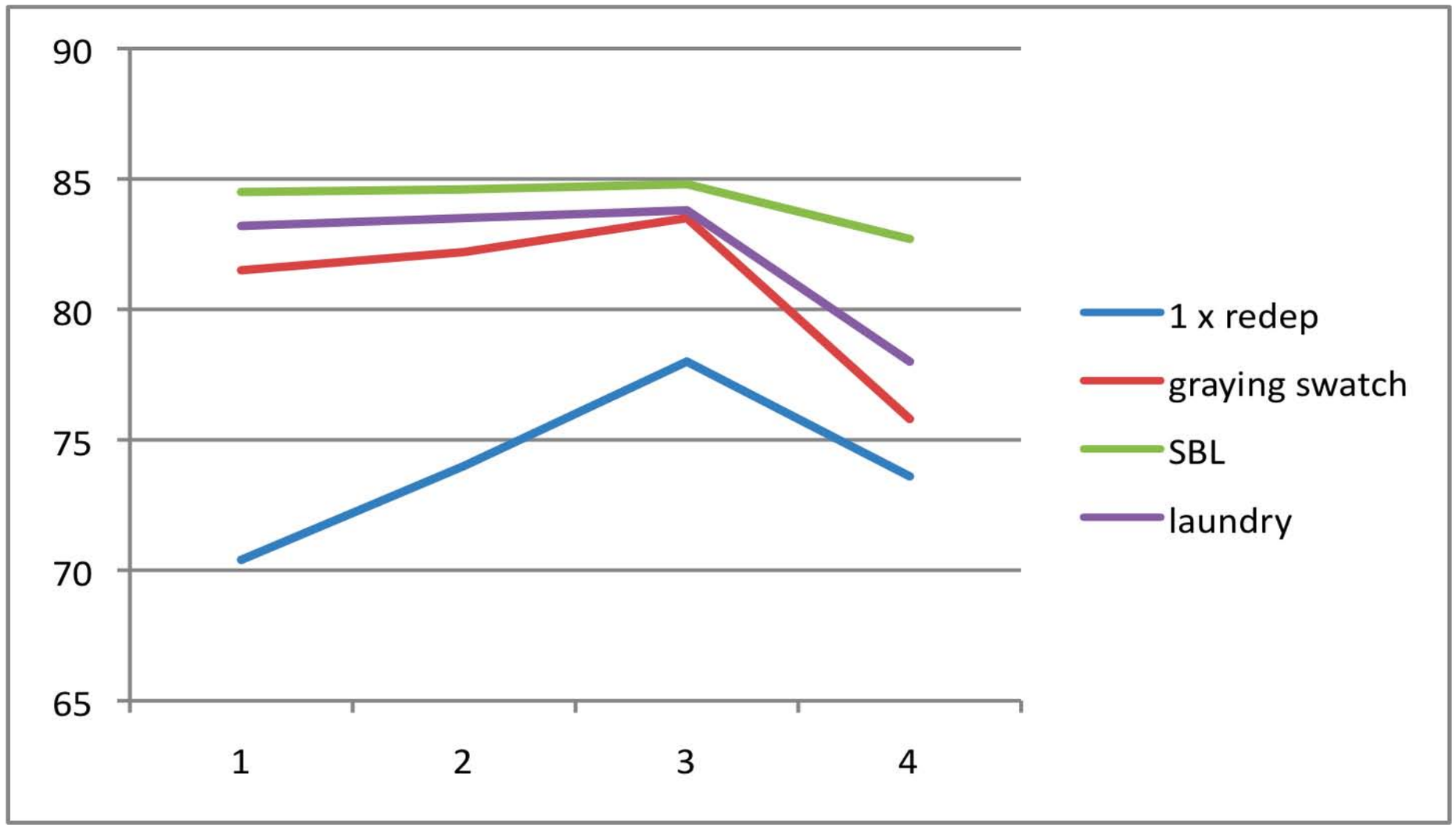
+

+ clean loads, **5 cycles** → Realistic graying level!

Test against other systems:

- Soiled laundry, 20 x
  (commercially available)
- SBL2004, 20 x
- other redepositon system, 1 x

Comparing 4 different systems (redep on CO)



Latest example:

Test fabric 100% Cotton, ISO 2267
4 Products (2 powders, 2 liquids), 40°C

ΔY				
	- 1,4	- 12,5	- 6,9	- 8,5
Comparison: StiWa results 2009				
	2	4	3	3

In April 2010, experts presented and discussed test methods, results and related experience at an „Expert workshop on the assessment of textile greying due to laundry cleaning“ in Wageningen (NL).

Participants

Mr. Thomas Rechenbach	(Henkel, Germany)
Mr. Hans-Jürgen Riebe	(Henkel, Germany)
Mr. Luca Spadoni	(Reckitt Benckiser, Italy)
Mrs. C. Tveit	(Reckitt Benckiser, Italy)
Mr. Bernhard Enders	(Dalli, Germany)
Mr. Erik Krijnen	(Unilever, The Netherlands)
Mr. Rainer Lodewick	(P&G, Belgium)
Mrs. Inge van Kessel	(SOHIT, The Netherlands)
Mrs. Annemiek Schop	(SOHIT, The Netherlands)
Mr. Thomas Hilgers	(WfK, Germany)
Mrs. Anke Ophüls	(WfK, Germany)
Mr. Caspar van Leeuwen	(CFT, the Netherlands)
Mrs. Scherrer	(EMPA Testmaterials, Switzerland)
Mr. Joachim von Schnitzler	(JVSE, Germany)
Mr. P.M.J. Terpstra; convenor	(CTKC, the Netherlands)

The wfk Greying Swatch was accepted as a good starting point, apparently working in many cases, but a few concerns were expressed:

- Still slightly too high greying level
- Possible risk of unrealisticly high response to polymers
- Lower standard deviation welcome

We took the remarks seriously, ran tests to verify them and finally developed a revised Greying Swatch to cope with the remaining weaknesses.

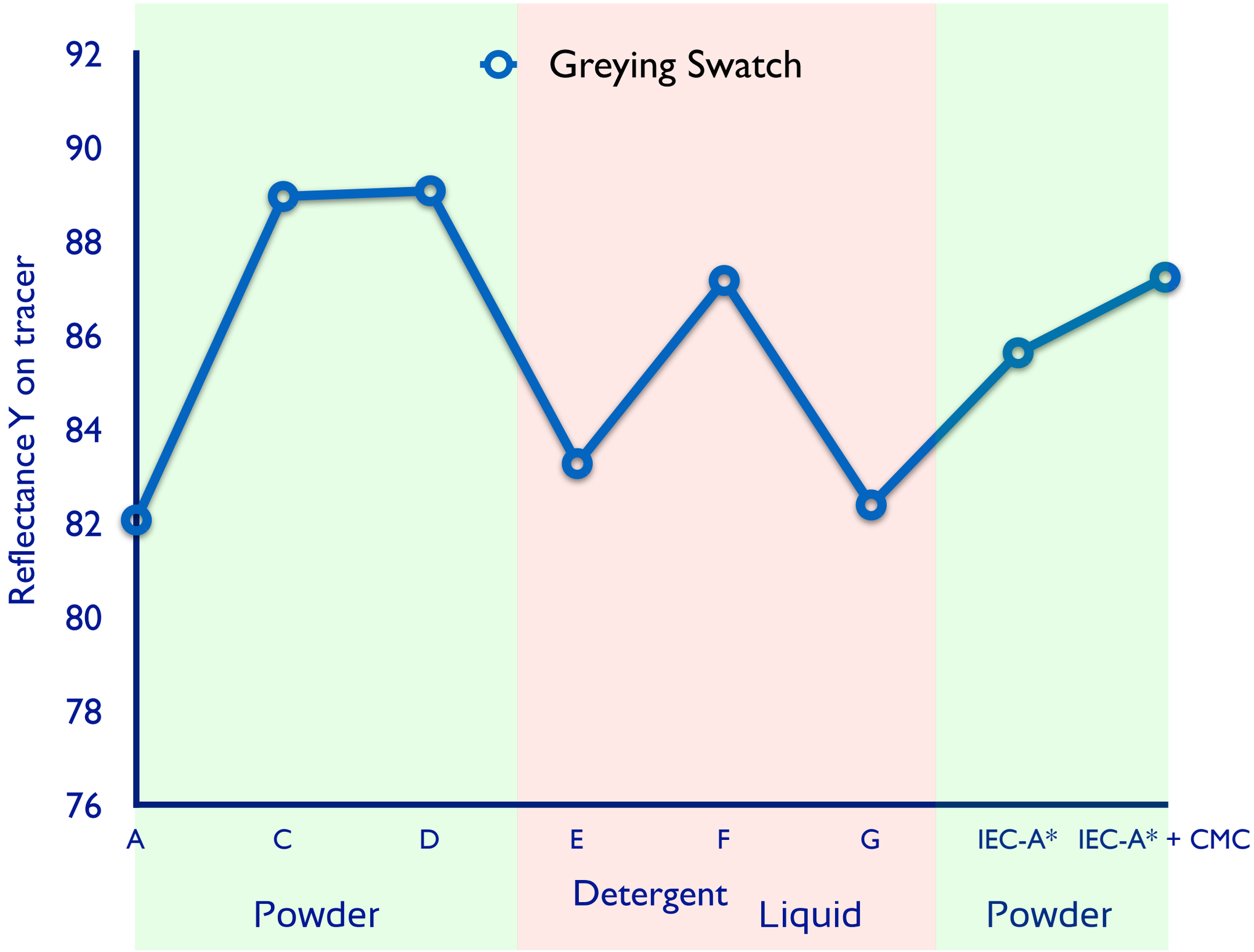
In an extensive study the existing and new systems were tried in comparison.

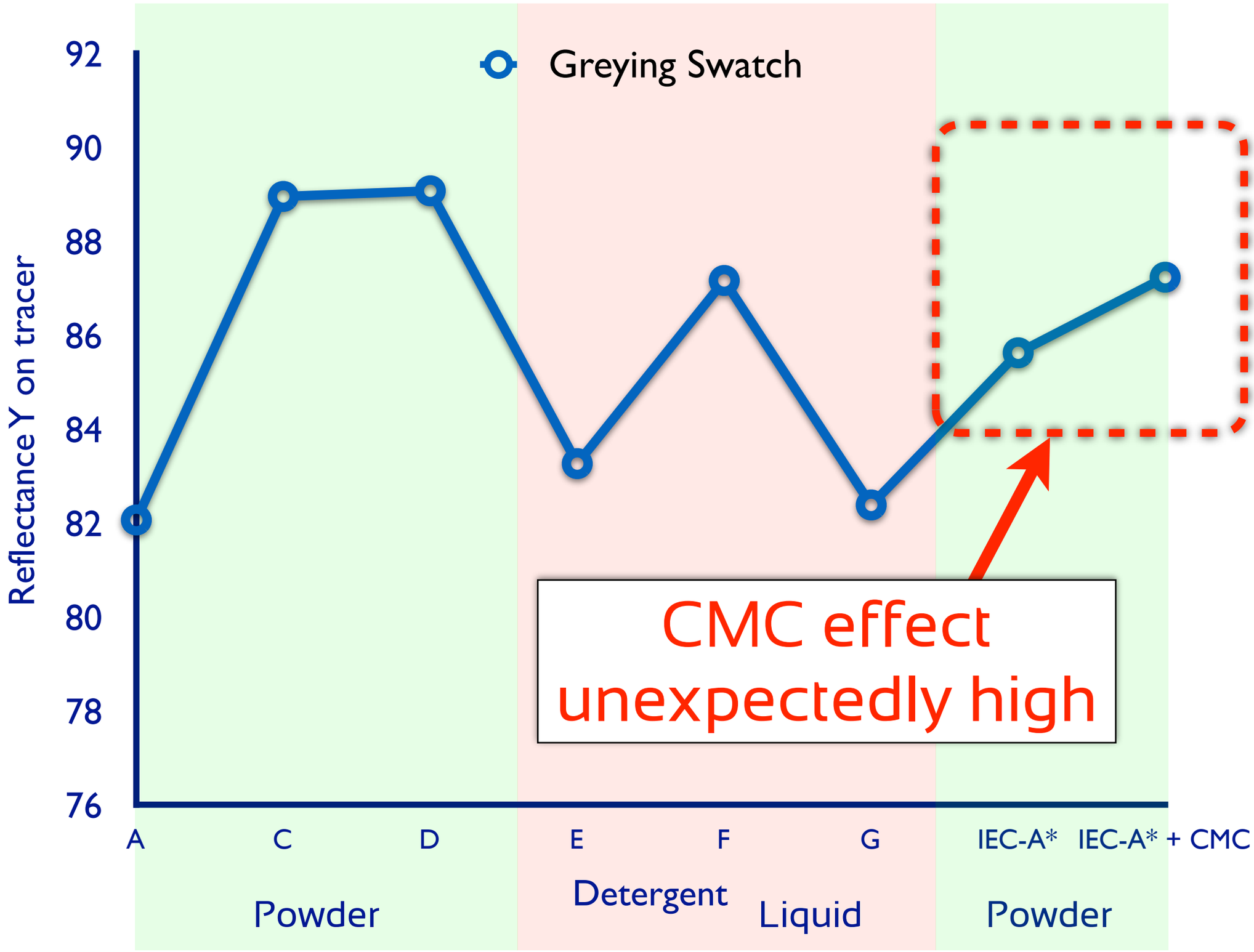
- We tested 6 HD market detergents (DE), IEC-A*, IEC-A* + CMC
  (we actually tested one more, I'll explain why this is not mentioned here)

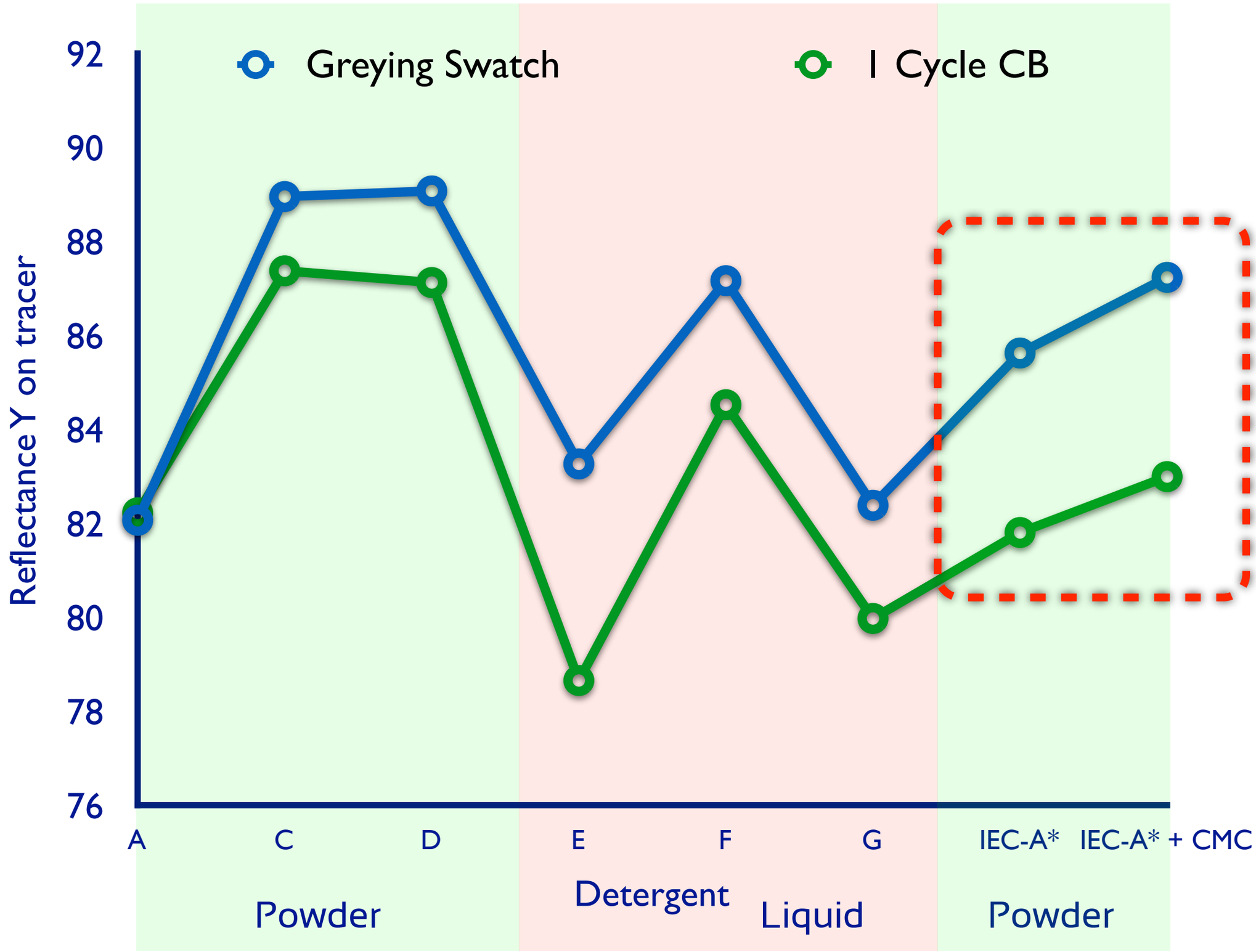
- 3 + 2 powders, 3 liquids

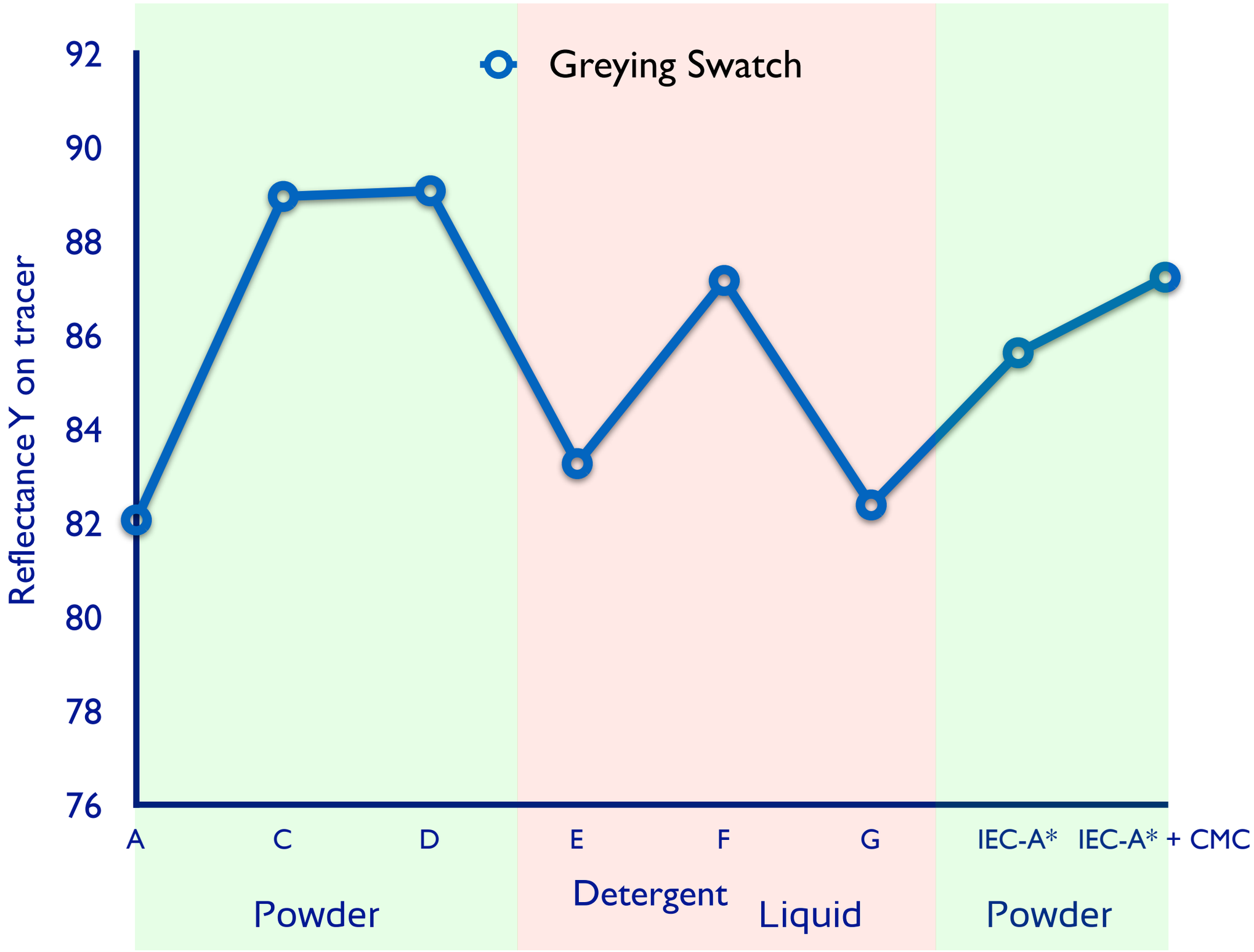
  - Wash temp. 40°C
  - Load 3,5 kg
  - Hardness 2,5 mmol/l
  - Tracer fabrics: **CO**, CO/PES, PES, Nylon

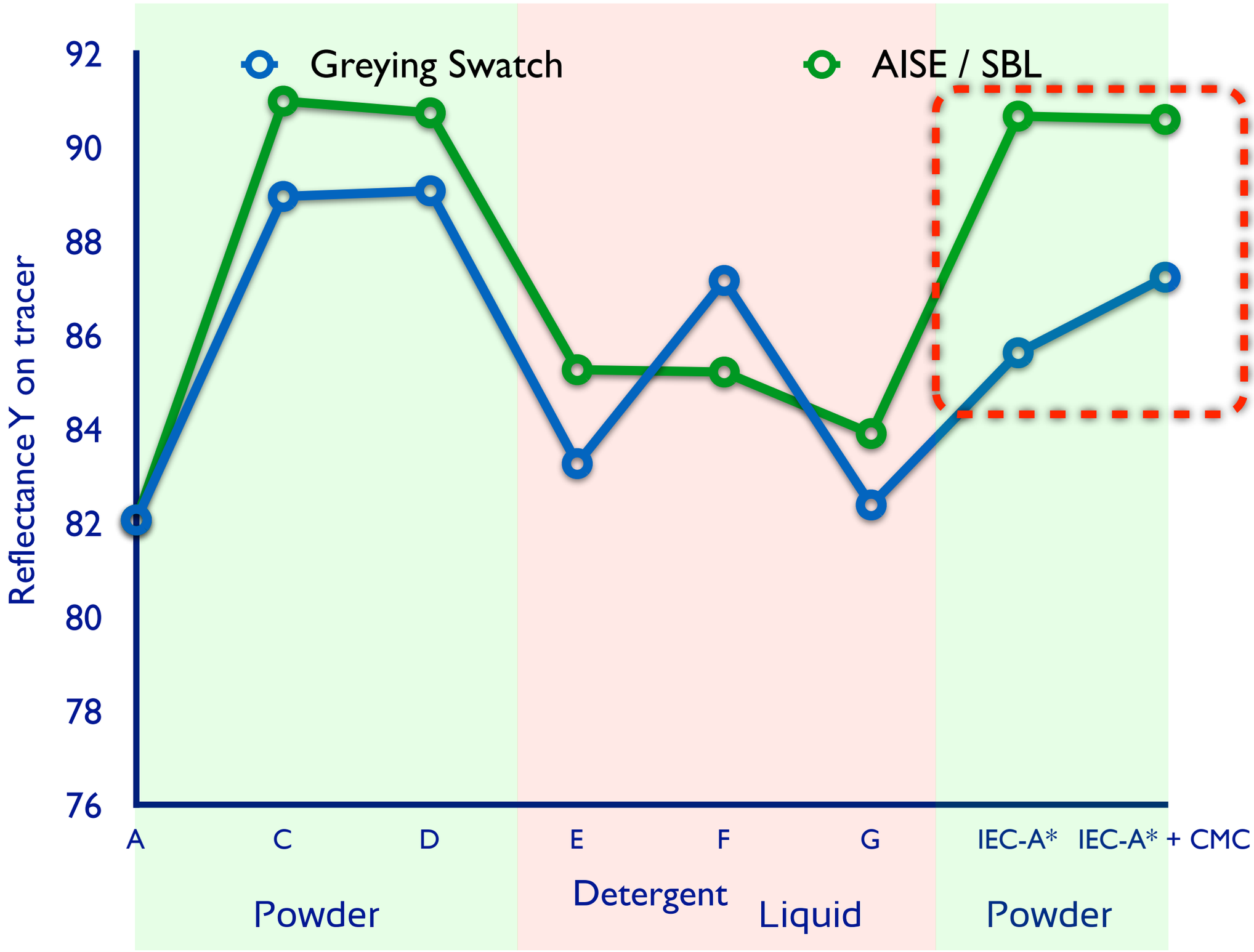
- The number of test runs depended on the test approach:
  - AISE / SBL: 20 cycles
  - Greying Swatches: 5 cycles
  - 1 cycle Carbon Black: 5 x 1 cycles

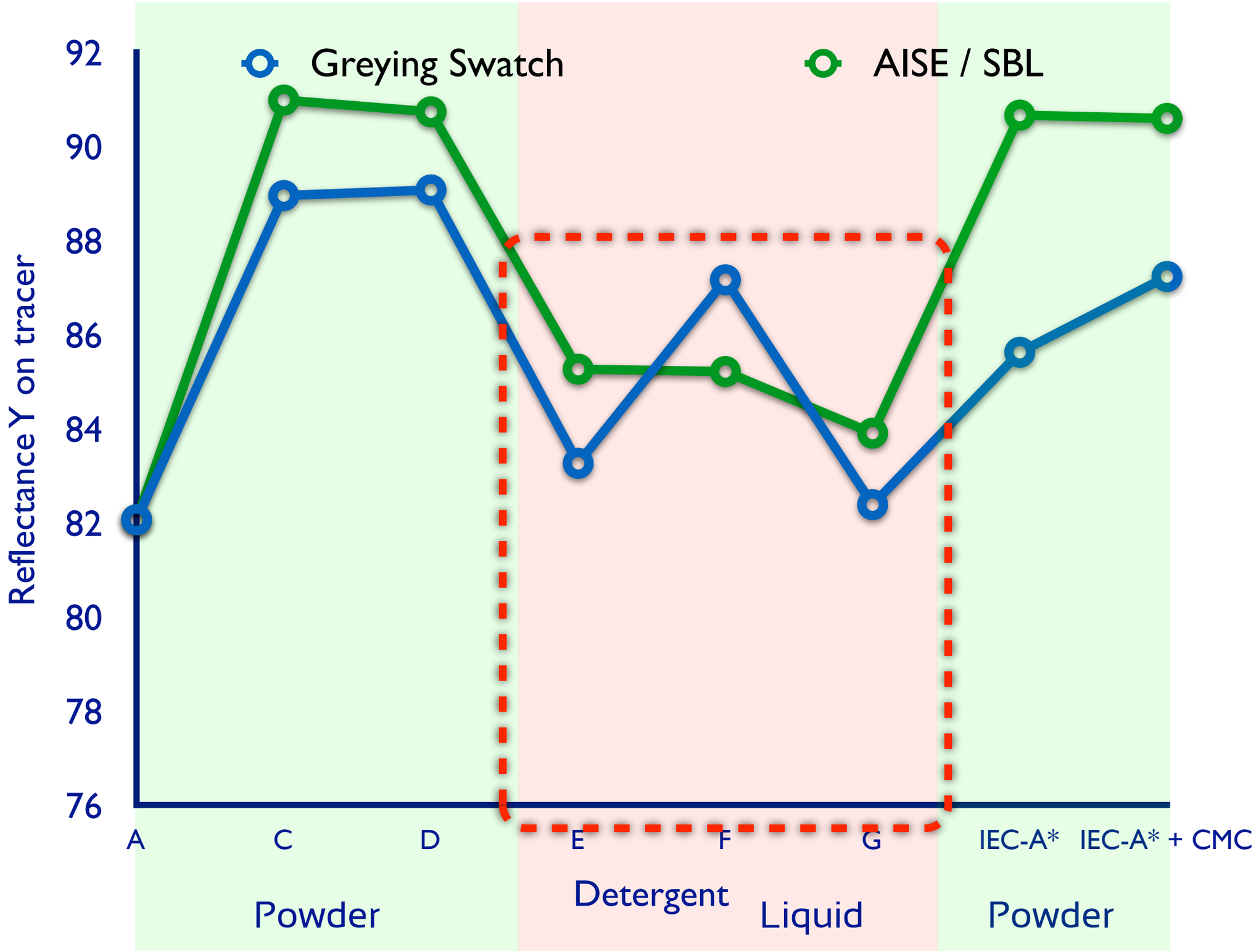


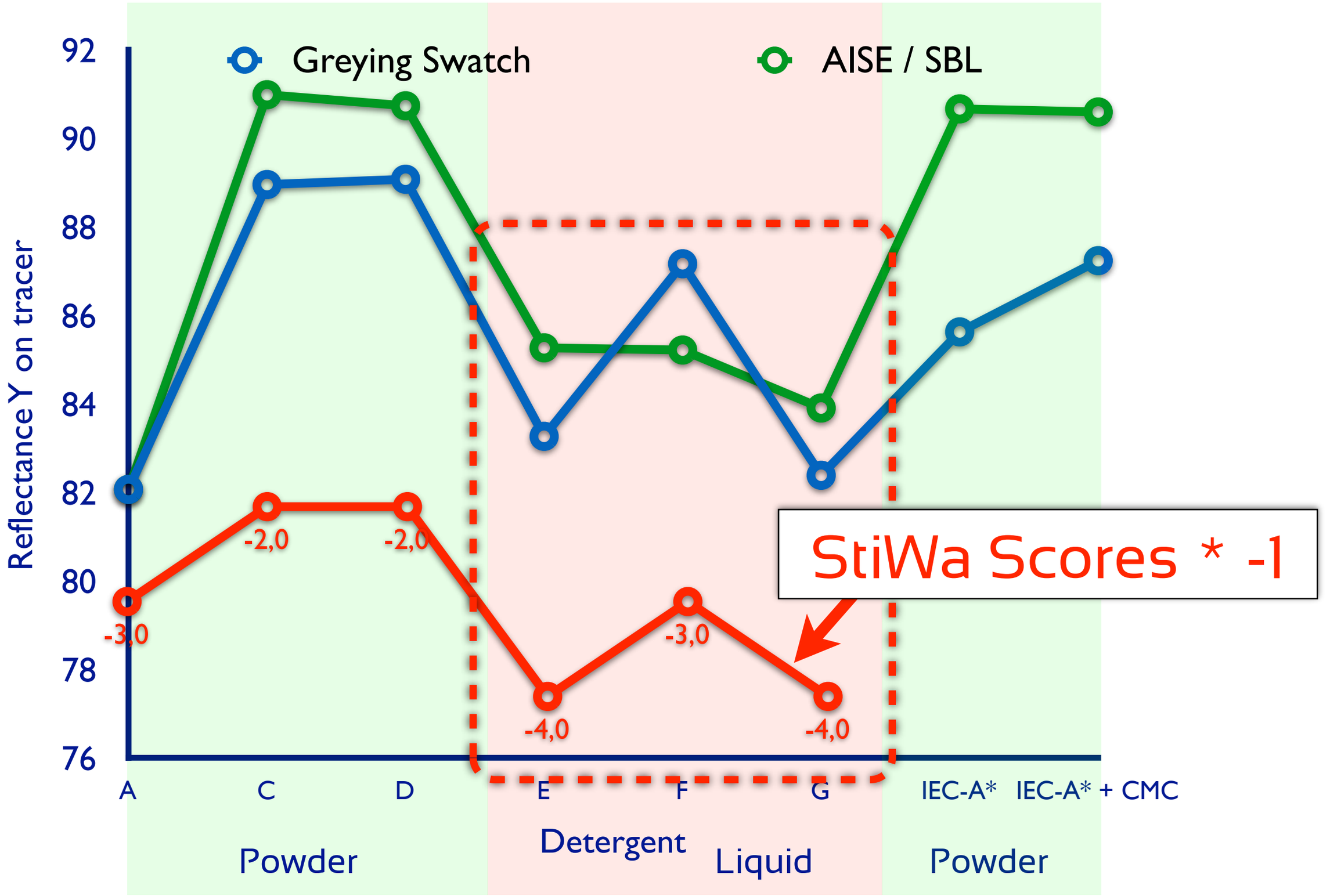


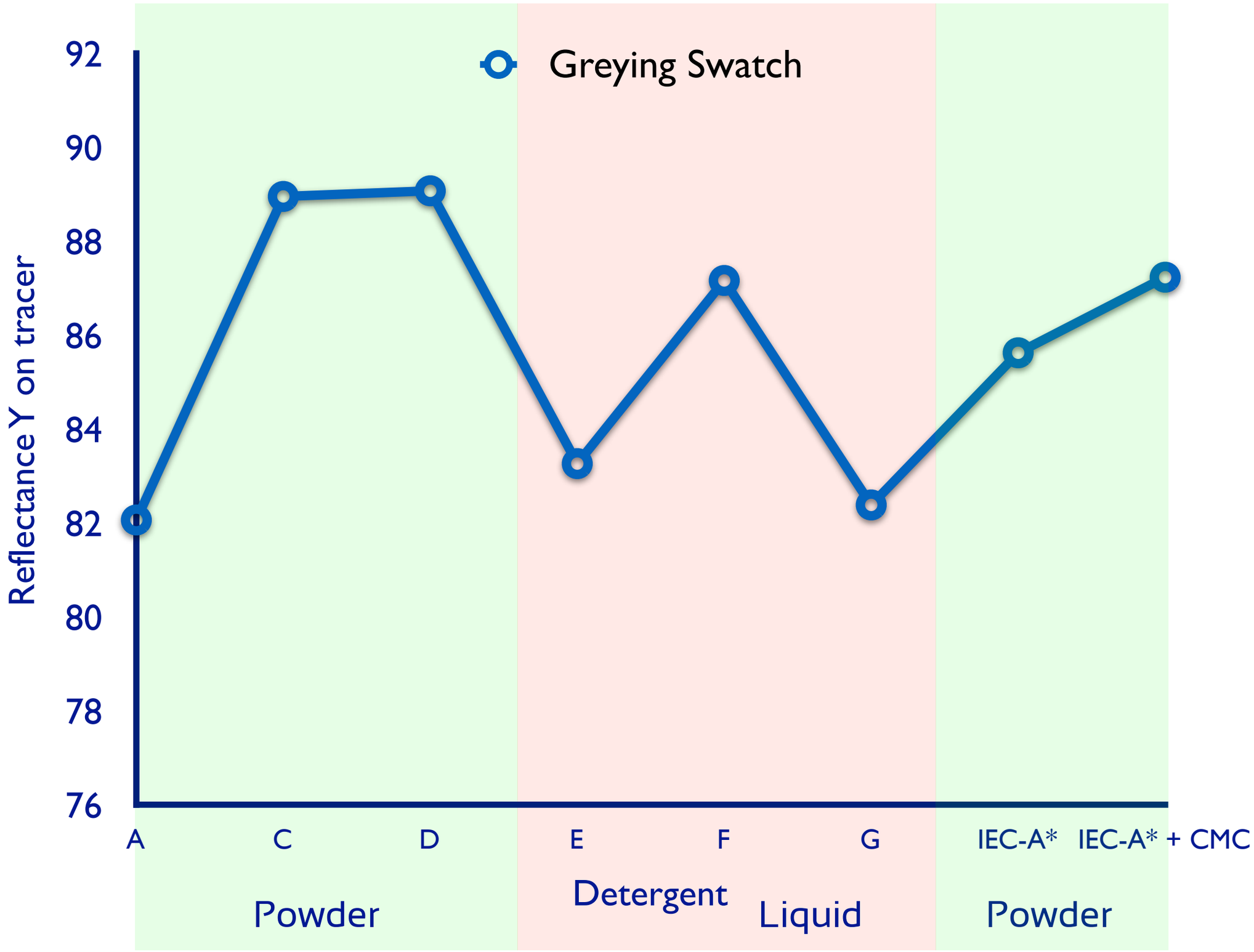


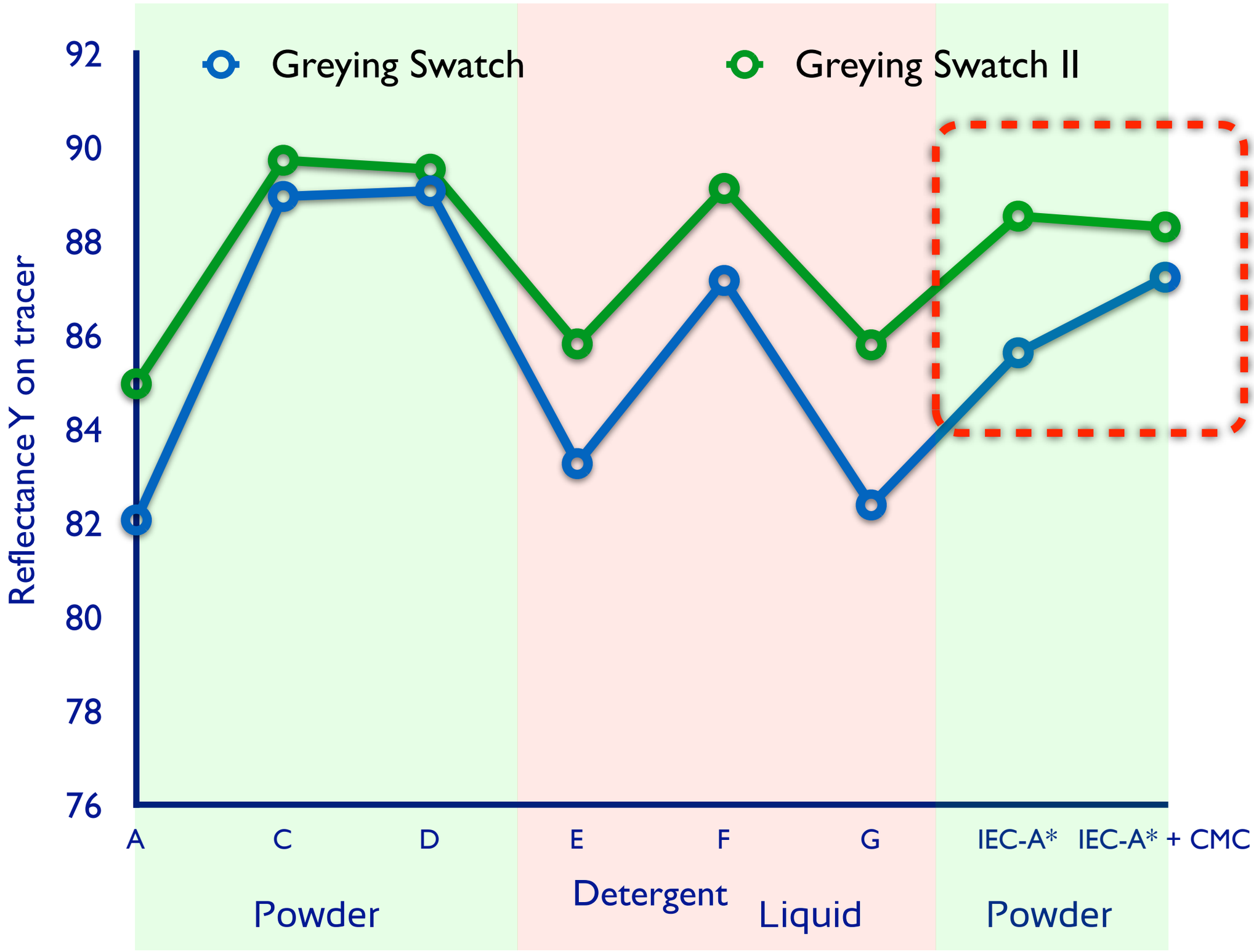




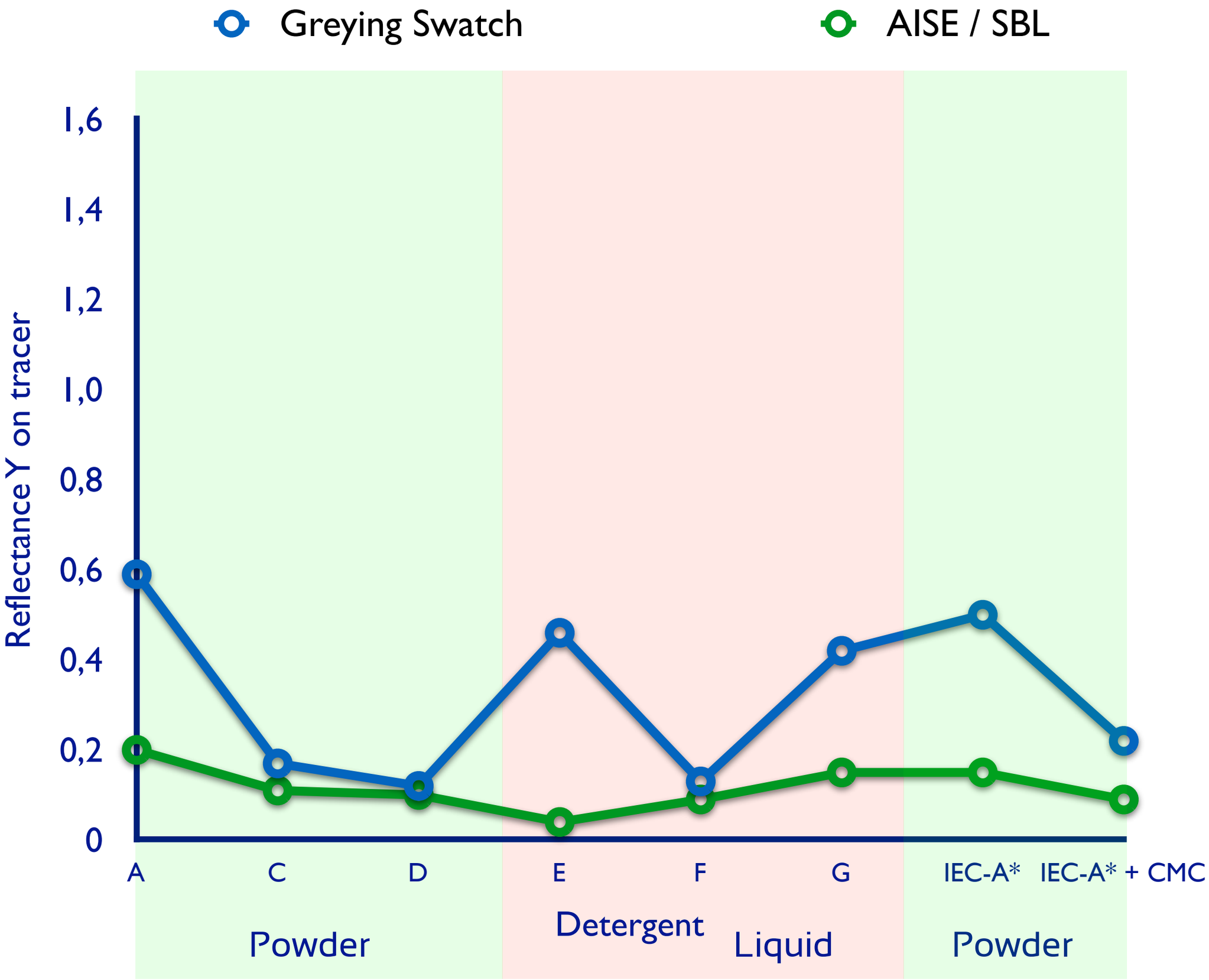


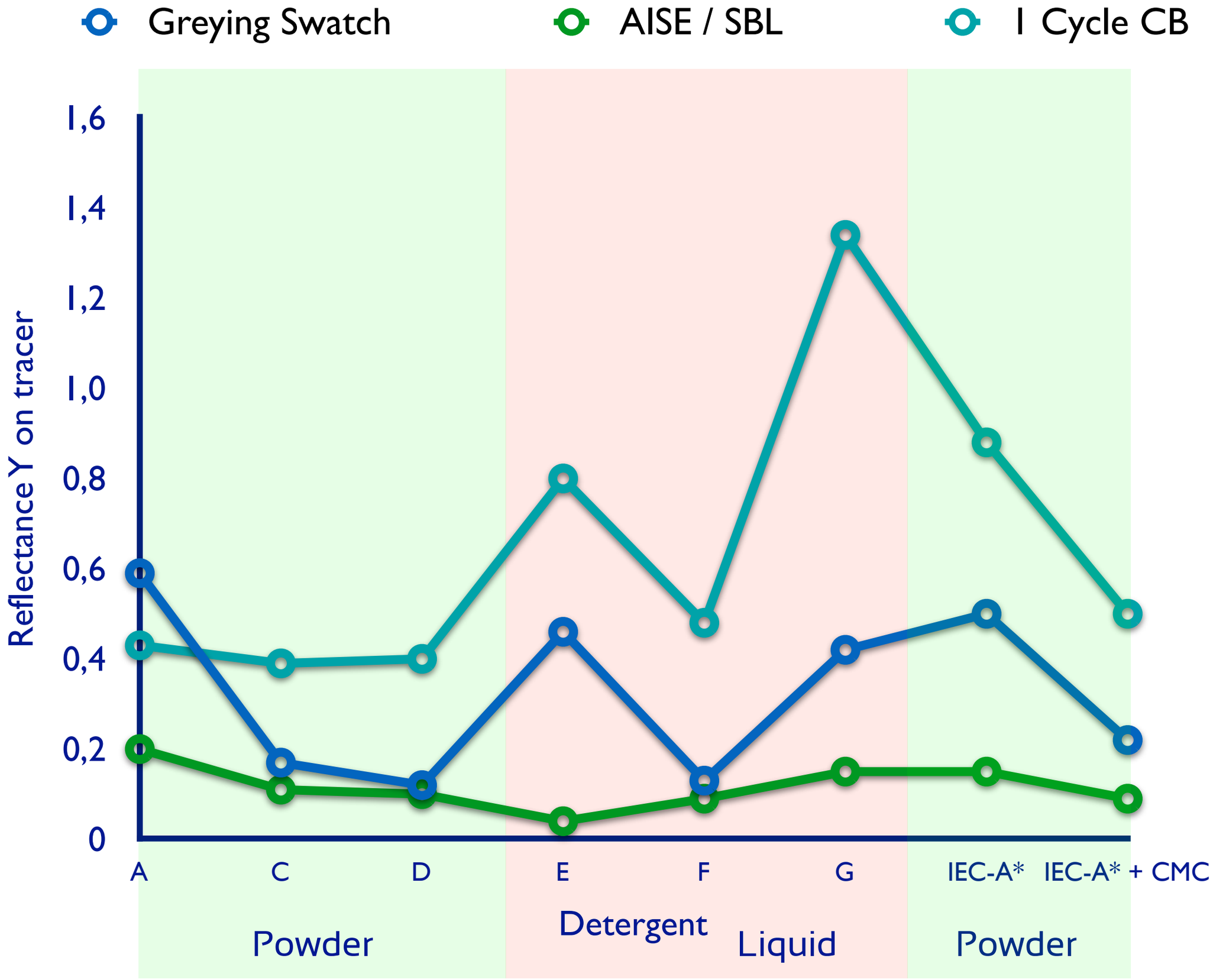


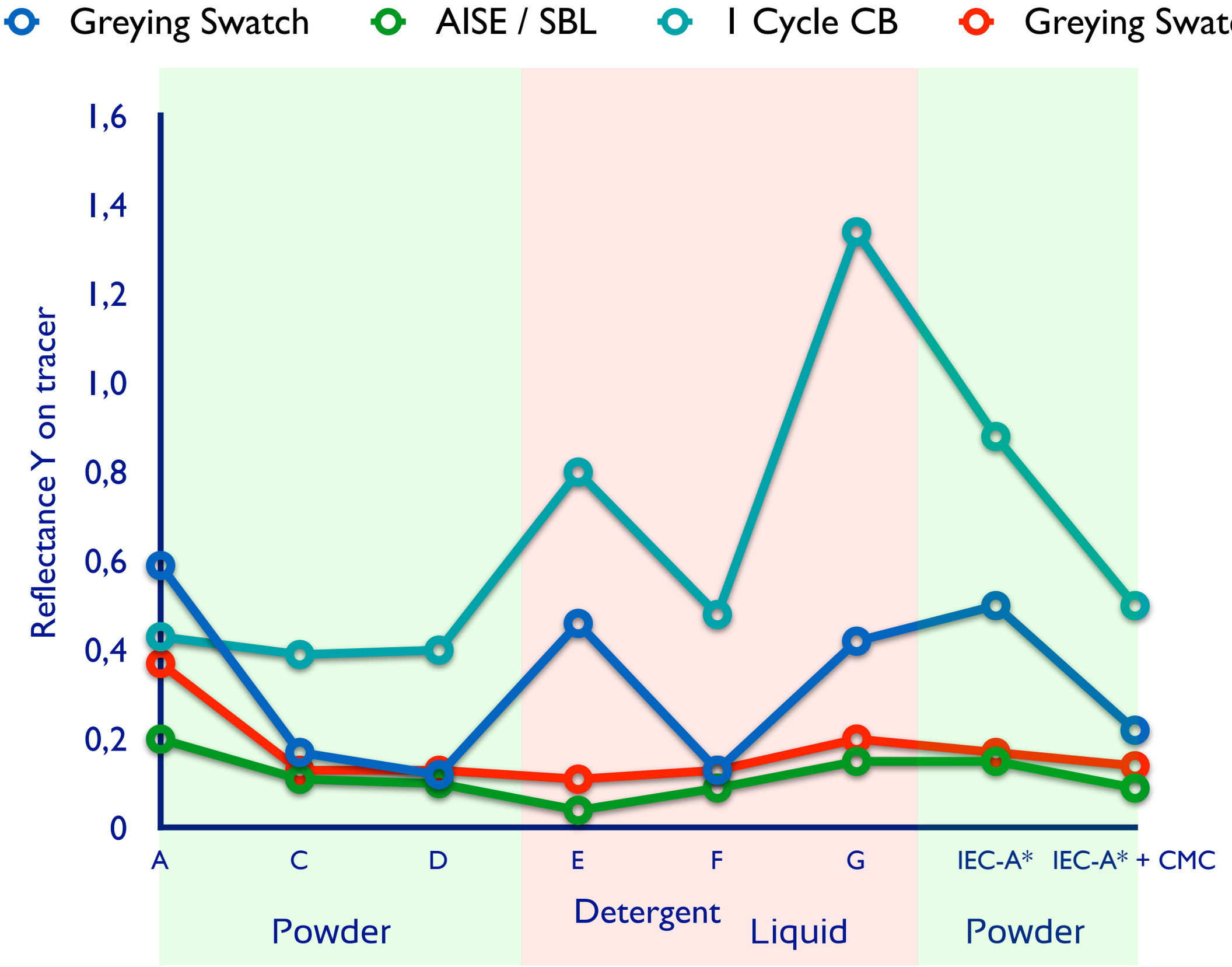




Noise level of test results ...







Additional Remarks

- We had initially tried the new approach as a combination of a (partial) Greying Seatch + SBL swatches.
- Next we developed a Greying Swatch II giving almost exactly the results of the ‚combination approach'
- We repeated the Greying Swatch treatments in full new test series and found excellent repeatability.

Conclusion ...

Conclusion

- The Greying Swatch II approach shows a good correlation with the StiWa results (based on wash/wear and visual assessment).
- The results indicate the relevance of the concerns expressed during the Greying Workshop.
- The Greying Swatch II appears to address the issues adequately.

Conclusion

- We suggest to use the 5 cycle Greying Swatch II system for accelerated (but not exaggerated) redeposition testing.
- The system is commercially available.

Conclusion

- Phase II of our project compares the new system against wash/wear results for a further range of market detergents. Results should be available in summer/ autumn 2011.
- We will present all our results in detail in a planned 2nd Workshop in Wageningen (probably autumn 2011).

Thank you!