

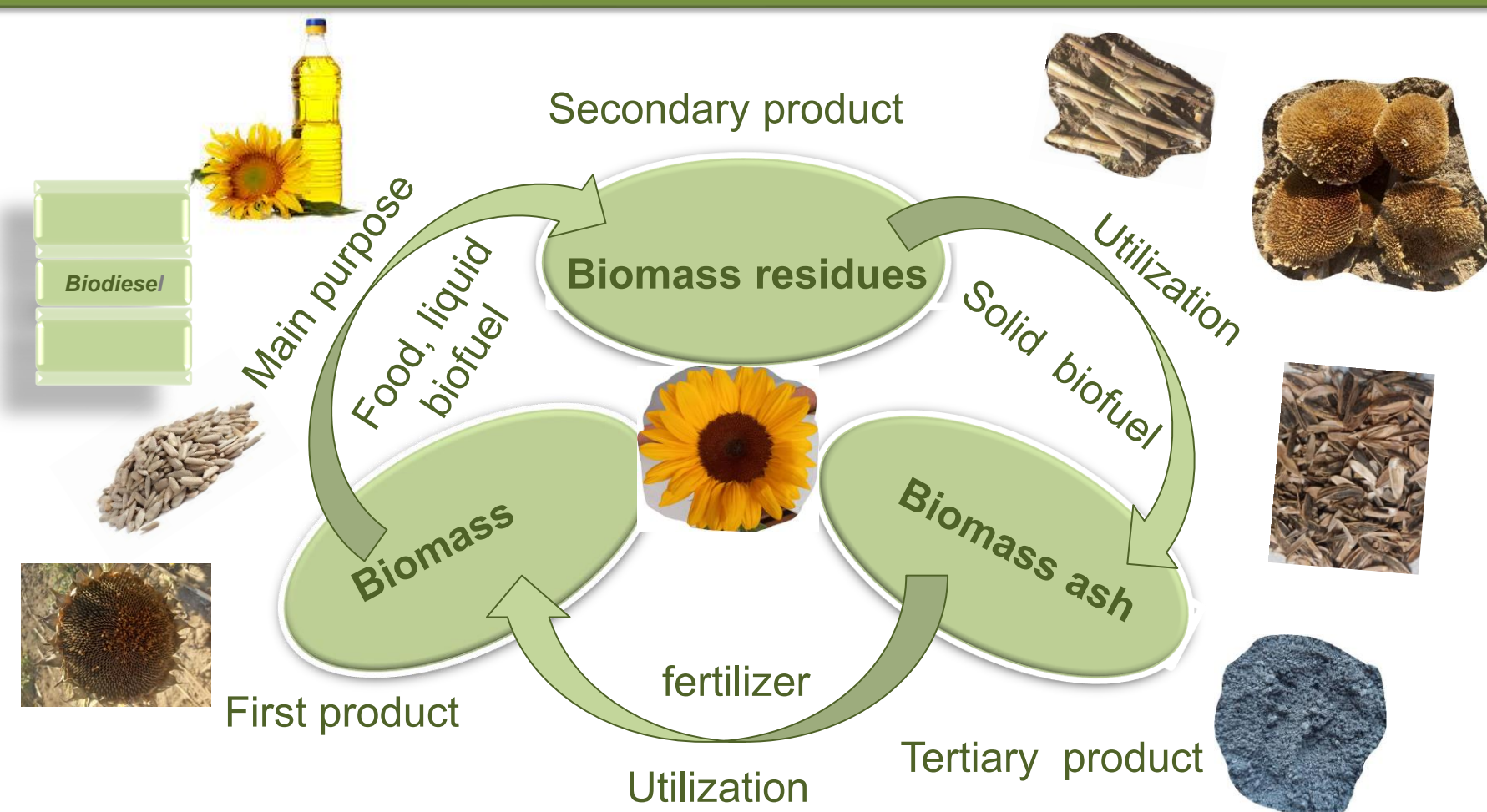
Alkalizing properties of biomass ash

Tsvetelina Petrova¹, Viktoria Nikolova¹, Denitza Zgureva-Filipova¹, Kalin Filipov²

Technical College of Sofia, Technical University of Sofia, 1000 Sofia, Bulgaria¹

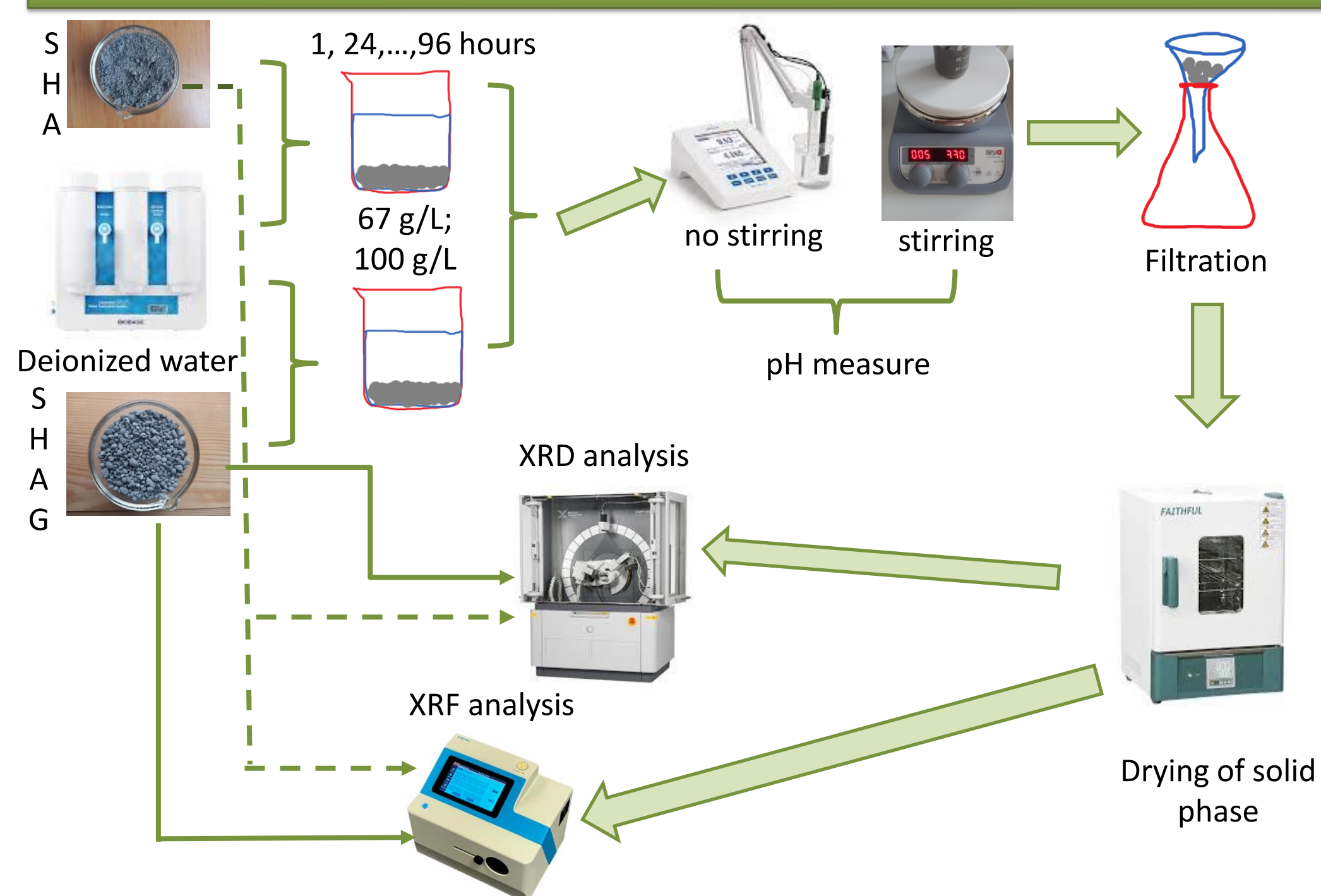
Faculty of Power Engineering and Power Machines, Technical University of Sofia, 1000 Sofia, Bulgaria²

INTRODUCTION & AIM



The current study aims to investigate the specific alkalizing properties of sunflower husk ash (SHA) in two forms: as received and sunflower husk ash granules (SHAG).

METHOD



RESULTS & DISCUSSION

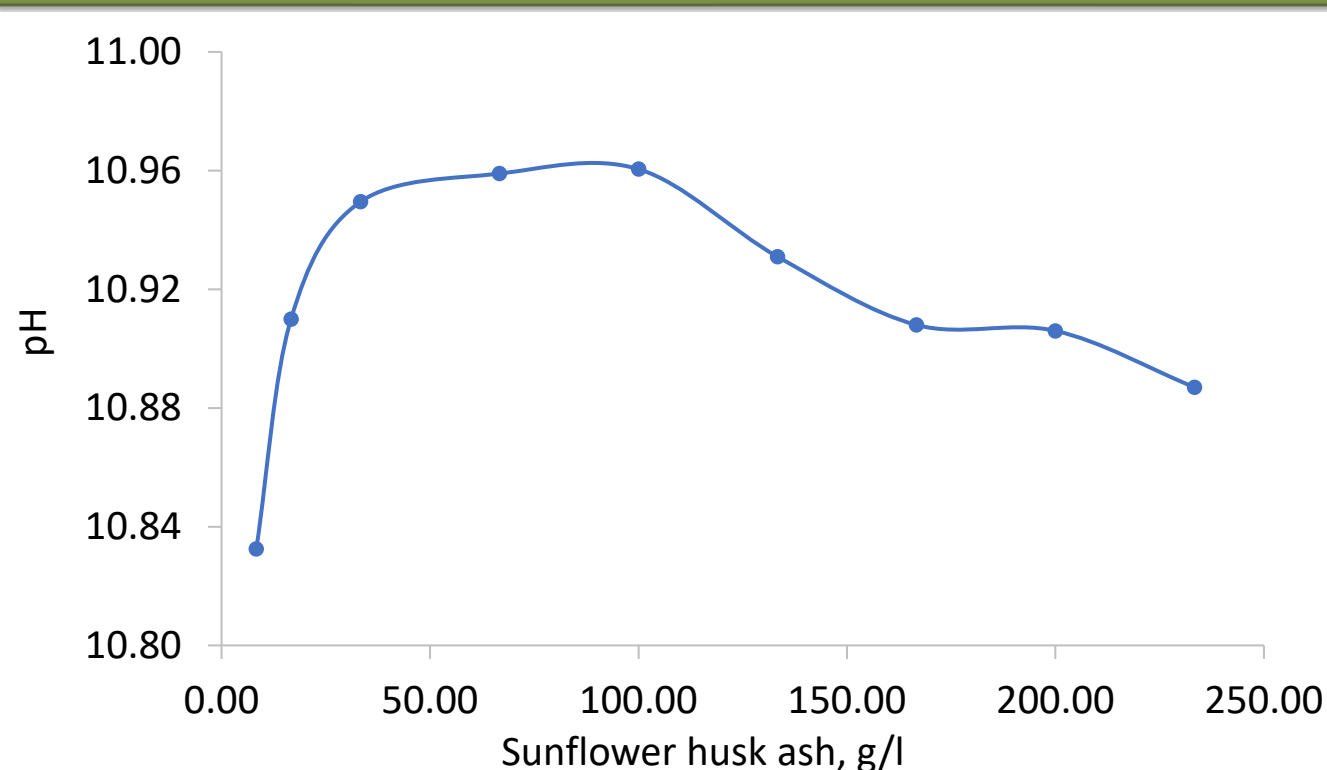


Fig. 1. Determination of the optimal amount of biomass ash

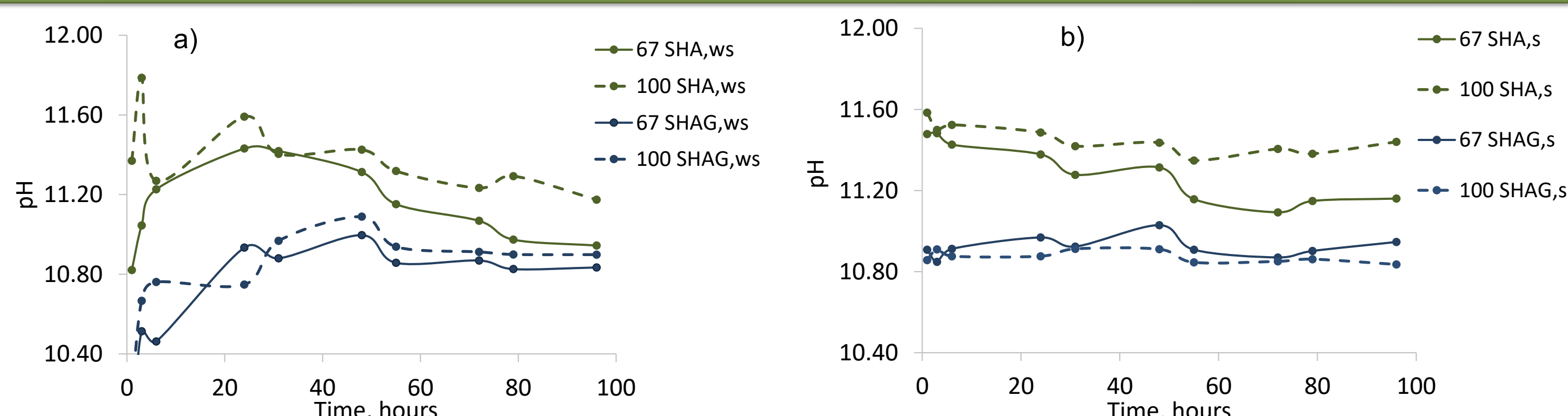


Fig. 2. Influence of a) contact time and b) stirring on the pH value

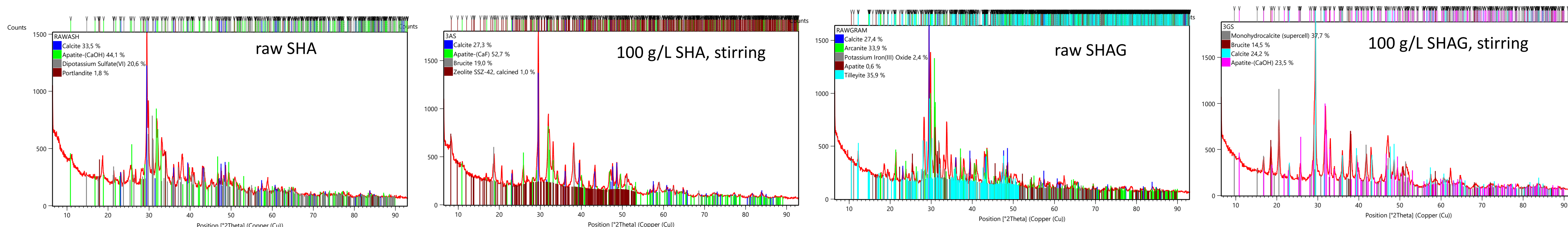


Fig. 3. Results from XRD analyses of raw SHA, solid phase of 100 g/L SHA with stirring, raw SHAG and solid phase of 100 g/L SHAG with stirring

Table 1. Results from XRF analyses

	SHA			SHAG		
	Raw ash, wt. %	Solid phase, wt. %	Liquid phase, wt. %	Raw granules, wt. %	Solid phase, wt. %	Liquid phase, wt. %
H			36.05			37.58
O	66.59	51.99	63.1	26.88	67.84	61.3
Na	5.14	2.69	0.6	3.57	5.63	0.16
Mg	5.32	10.33		6.09	7.66	
Al	0.26	0.23	0.02	0.36	0.37	0.03
Si	0.66	1.24		0.99	1.28	
P	1.98	3.94		1.31	2.12	
S	0.38	0.02	0.09	1.95	0.05	0.15
Cl	0.33	0.03		0.63	0.03	0.05
Ar	0.1	0.16		0.4	0.08	
K	9.33	2.78	0.64	15.79	1.64	0.72
Ca	8.25	15.59		11.66	12.6	
Fe	1.68	8.47		32.22	0.69	

CONCLUSION

The examined materials showed an identical alkalizing effect, with a 63% average increase in pH. The obtained high values of pH are an indicator that SHA and SHAG can be applied as green chemical materials in different processes – the production of liquid fertilizers, soaps, or for wastewater decontamination from heavy metals.

FUTURE WORK / REFERENCES

The future study includes experiments about the influence of sunflower husk ash and sunflower husk ash granules on the precipitation of heavy metals in wastewater.

ACKNOWLEDGMENTS

This work has been carried out in the framework of the National Program "Increasing Qualification in the Field of Nuclear Technologies and Nuclear Engineering", D01-99/26.06.2025.