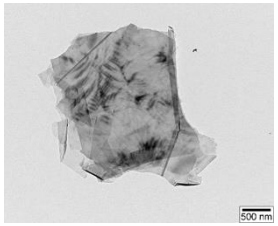
Short Term Scientific Mission funded by the COST Action CA22131

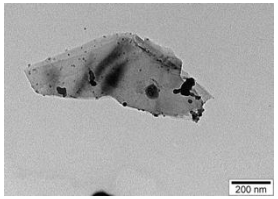
Supramolecular LUminescent Chemosensors for Environmental Security

Heteroatom Doping and Co-Doping of Graphene for Highly Sensitive and Selective Gas Sensors in Environmental Security.

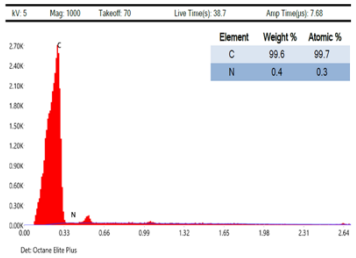
STSM aimed to investigate how N doping, P doping, and N,P co-doping modify the structural, chemical, surface, and electrical properties of graphene nanoplatelets (GNPs) and to identify the most promising compositions for future gas-sensing applications. Among the investigated compositions, 2% N-GNP exhibited the most favorable overall performance within the N-doped series, while 3% P-GNP was identified as the most promising composition within the P-doped series; in contrast, N,P co-doped GNPs did not exhibit the desired improvement in the investigated properties under the applied synthesis conditions.

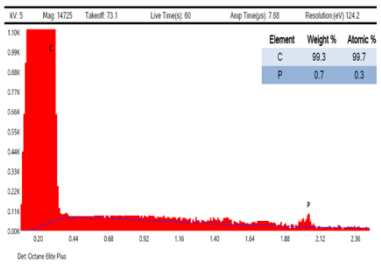
TEM



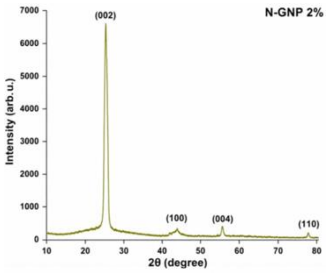


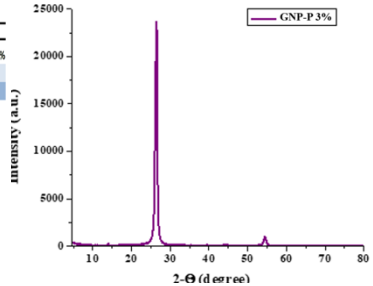
EDS



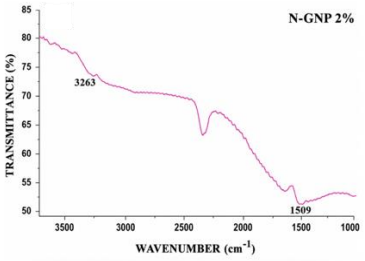


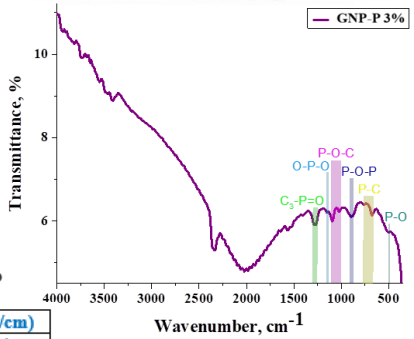
XRD



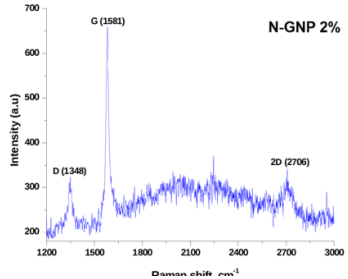


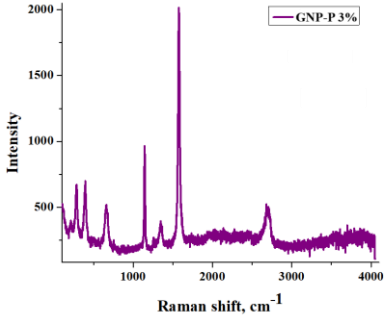
FTIR





RAMAN





Sample	Assignment	Binding energy
GNP-N 2 %	Pyridinic N	~399.6 eV
	Graphitic N	~401.5 eV
GNP-P 3%	P–C / graphitic P	~132.2 eV
	P–O / P–O–C	~134.1 eV
	P=O / oxidized P	~135.3 eV

Sample	ρ (Ω·cm)	σ (S/cm)
GNP-P 1%	0.57	1.754
GNP-P 2%	0.303	3.30
GNP-P 3%	0.769	1.3004
GNP-P 4%	0.513	1.949
GNP-P 5%	0.615	1.626

Sample	ρ (Ω·cm)	σ (S/cm)
GNP-N 1%	0.0194	51.546
GNP-N 2%	0.0138	72.727
GNP-N 3%	0.459	2.179
GNP-N 4%	0.02	50
GNP-N 5%	0.039	25.641

Sample	BET specific surface area ($m^2 g^{-1}$)	Sample	BET specific surface area ($m^2 g^{-1}$)
GNP	29.8	GNP	29.8
GNP-N 1%	37.0	GNP-P 1%	13.5
GNP-N 2%	45.6	GNP-P 2%	14.6
GNP-N 3%	27.7	**GNP-P 3%**	15.1
GNP-N 4%	37.6	GNP-P 4%	14.0
GNP-N 5%	32.0	GNP-P 5%	7.6

Lala GAHRAMANLI

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