ADVANCED MATERIALS INTERFACES

Supporting Information

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The Role of Water in the Preparation and Stabilization of High-Quality Phosphorene Flakes

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Supporting Information

The role of water in the preparation and stabilization of high quality phosphorene flakes

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Test A) P/H_2O molar ratio equal to 15.0.

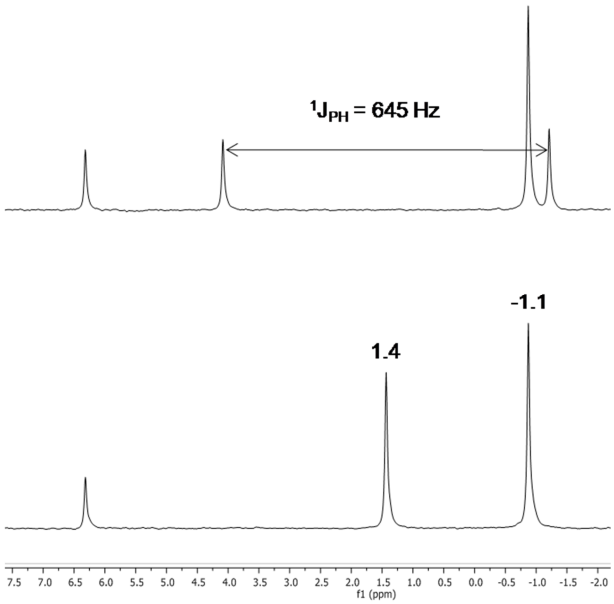

Figure S1. Up: ^{31}P NMR and down: ^{31}P {^1H} NMR (DMSO-d_6, T = 25°C, 121.49 MHz) spectrum of a sample of Test A after 4 hours of sonication.

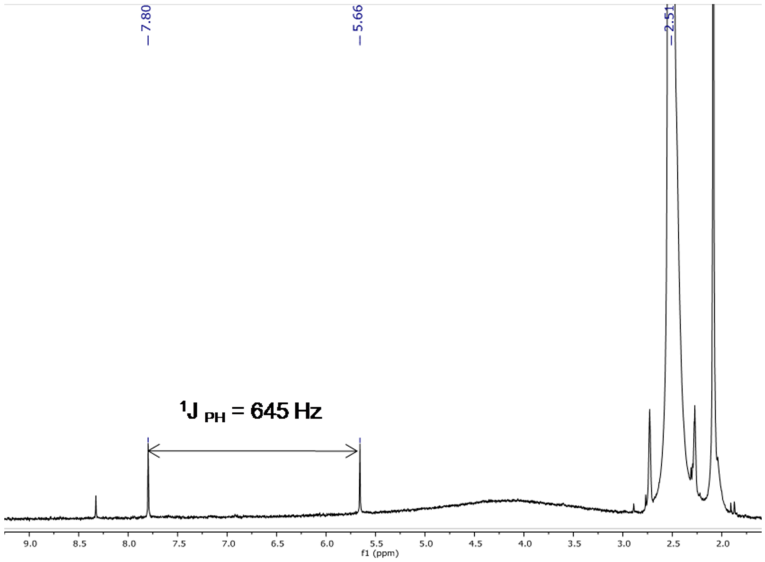

Figure S2. ^1H NMR spectrum (DMSO-d_6, T = 25°C, 300.13 MHz) after 4 hours of sonication.

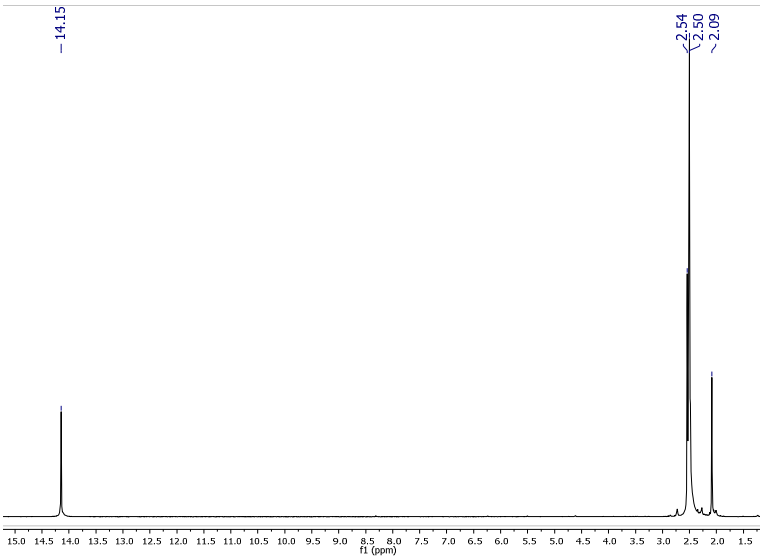

Figure S3. ^{1}H NMR spectrum (DMSO-d_6, T = 25°C, 300.13 MHz) after 20 hours of sonication.

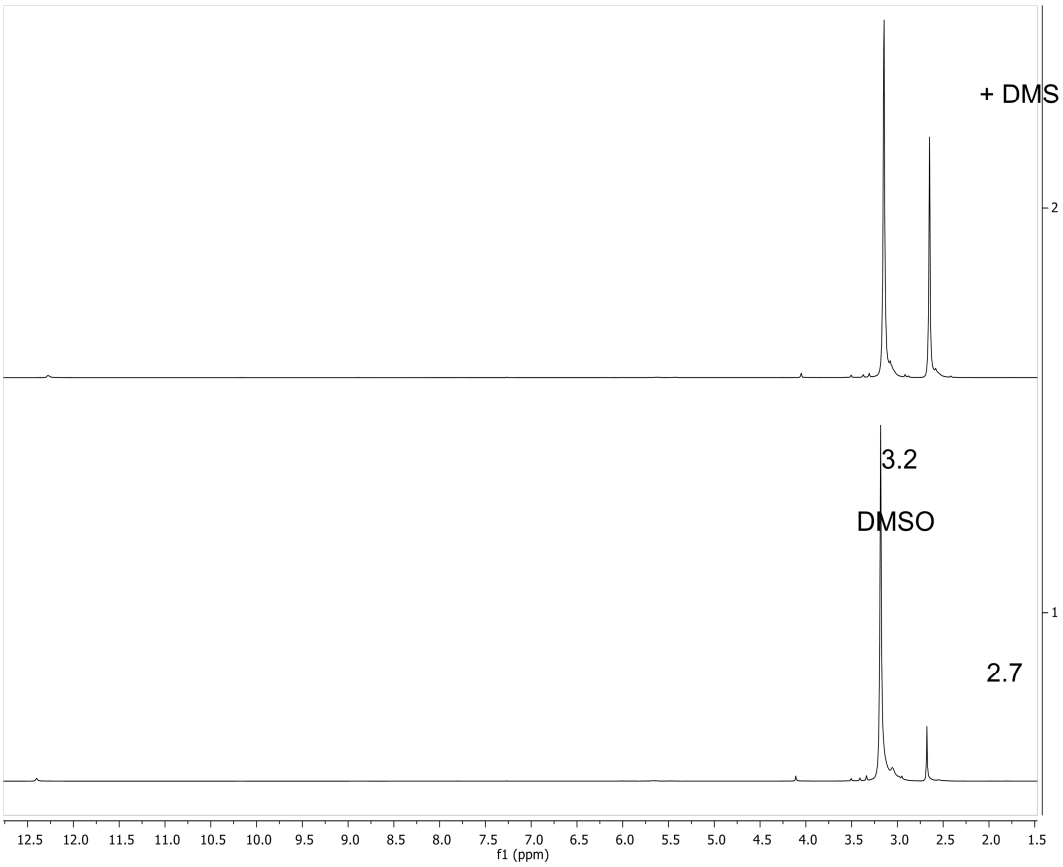

Figure S4. ^{1}H NMR (DMSO, T = 25°C, 300.13 MHz, capillary C_6D_6). Down: reaction mixture before adding [$S(CH_3)_2$]; top: after adding [$S(CH_3)_2$].

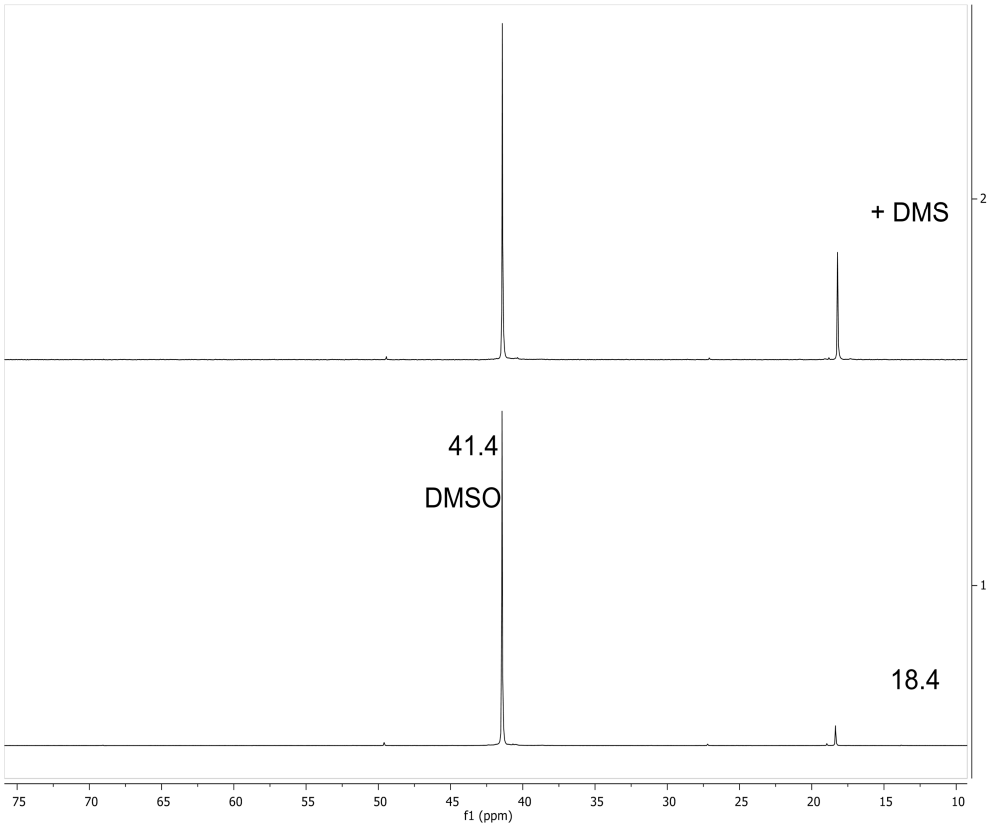

Figure S5. ^{13}C NMR (DMSO, T = 25°C, 75.5 MHz, capillary C_6D_6). Down: reaction mixture before adding $[S(CH_3)_2]$; top: after adding $[S(CH_3)_2]$.

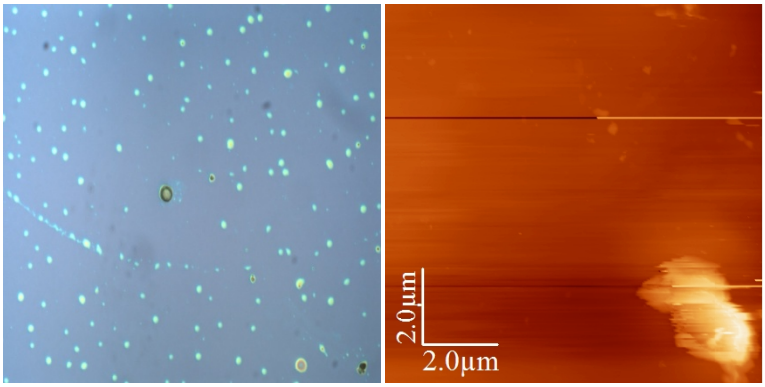

Figure S6. Left: optical microscopy image; Right: AFM of a sample of Test A after 20 hours of sonication, scale bar 2.0 µm.

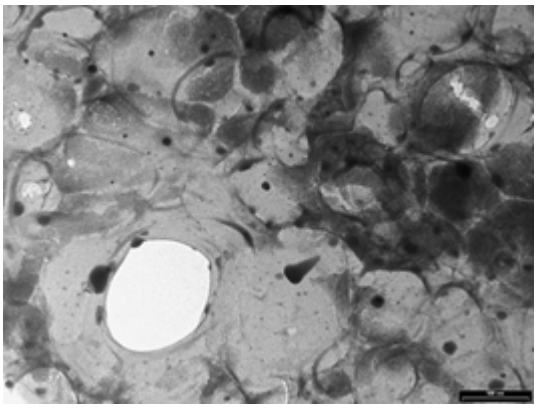

Figure S7. Bright field TEM image on holey carbon Cu grid of the sample in DMSO where P/H_2O molar ratio equal to 15. Scale bar: 500 nm.

Test B) P/H_2O molar ratio equal to 2.0.

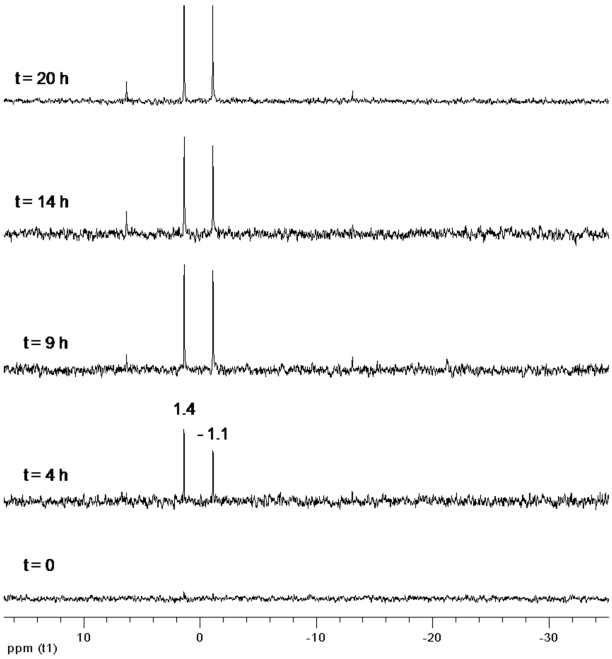

Figure S8. $^{31}P\{^1H\}$ NMR spectra (DMSO-d_6, T = 25°C, 121.49 MHz) of a sample of Test B, P/H2O molar ratio equal to 2, during sonication.

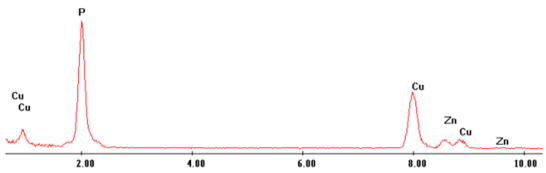

Figure S9. EDX carried out on the sample of Test B, P/H2O molar ratio equal to 2, after 20 h of sonication.

Test C) P/H_2O molar ratio equal to 0.7.

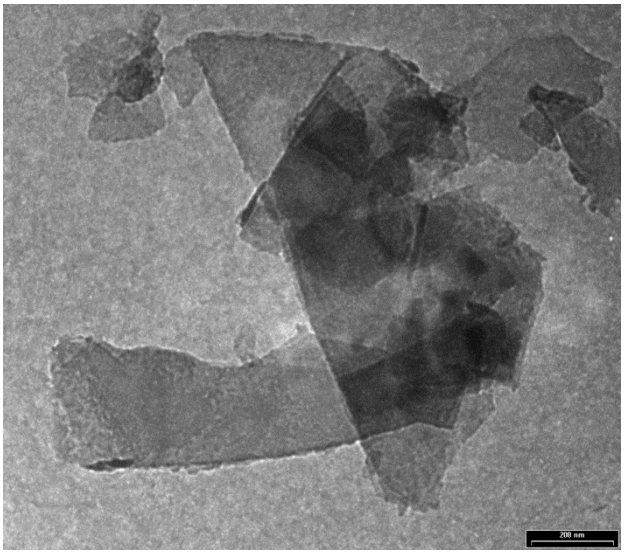

Figure S10. Bright field TEM image of DMSO-exfoliated BP nanosheets. Scale bar: 200 nm.

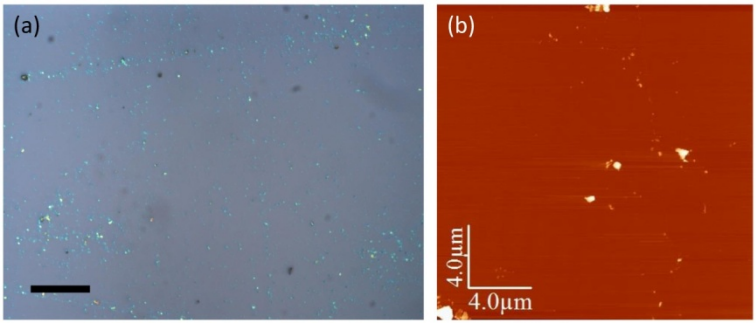

Figure S11. Left: Optical microscopy image, 144 µm x 108 µm, scale bar 30 µm; right: AFM image of a sample with P/H_2O molar ratio equal to 0.7.

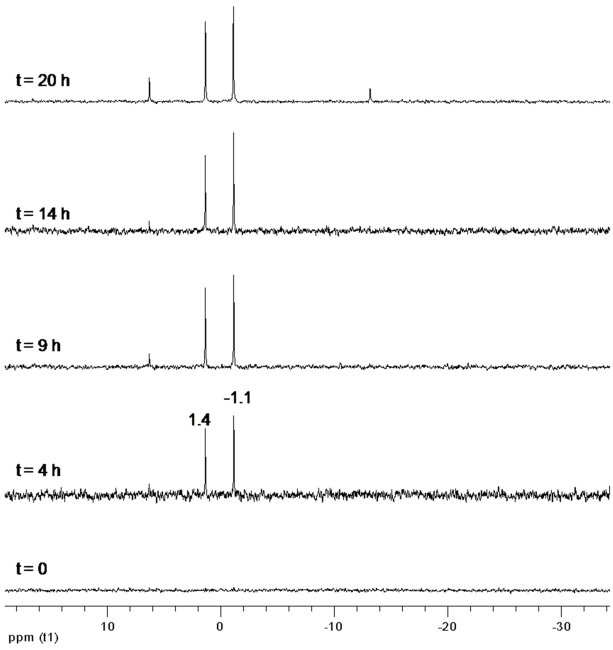

Figure S12. $^{31}P\{^{1}H\}$ NMR spectra (DMSO-d_6, T = 25°C, 121.49 MHz) measured during the sonication.

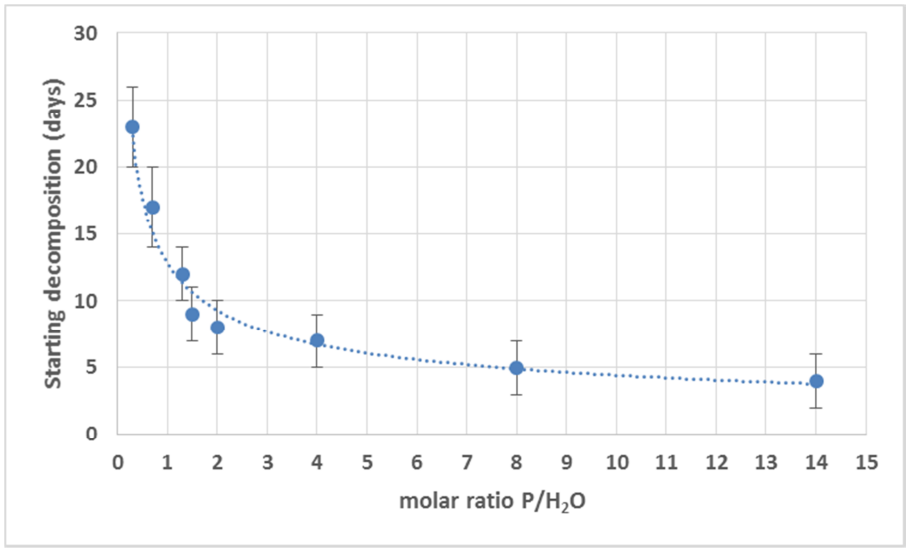

Figure S13. Starting of the exfoliated BP decomposition plotted against the P/H_2O molar ratio (as shown by the appearance of the -24.9 ppm signal in the $^{31}P\{^{1}H\}$ NMR)

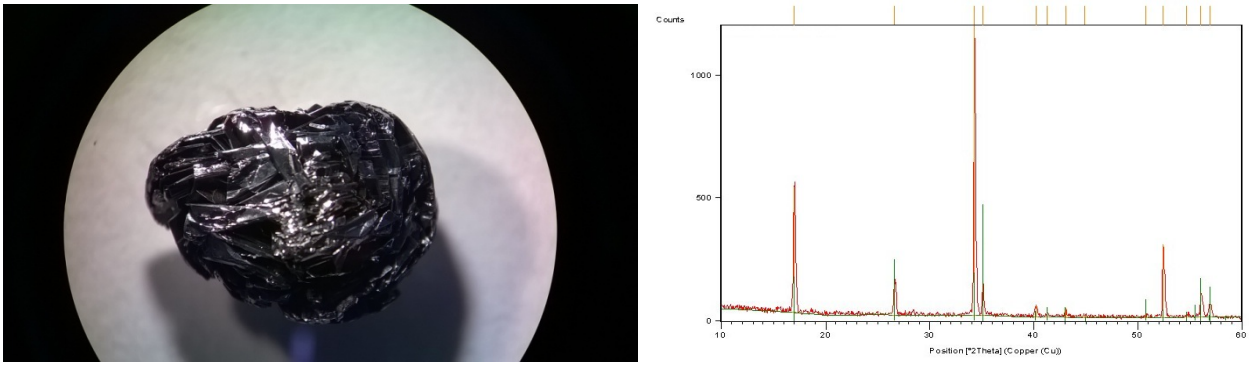

Figure S14. Picture of a BP crystal obtained after the synthesis (left); X-Ray powder diffraction of BP crystals (right).