

1 **Modeling of High-Pressure Methane Adsorption on Wet Shales**

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10 This Supporting Information accompanying the manuscript *Modeling of High-Pressure*
11 *Methane Adsorption on Wet Shales* provides the following information:

- 12 (a) Modified Langmuir model representations of methane adsorption on wet shales
13 (b) Relationship between the maximum methane adsorption capacity and water content
14 (c) Relationship between the Langmuir pressure and water saturation
15 (d) Relationship between the maximum methane adsorption capacity and TOC content

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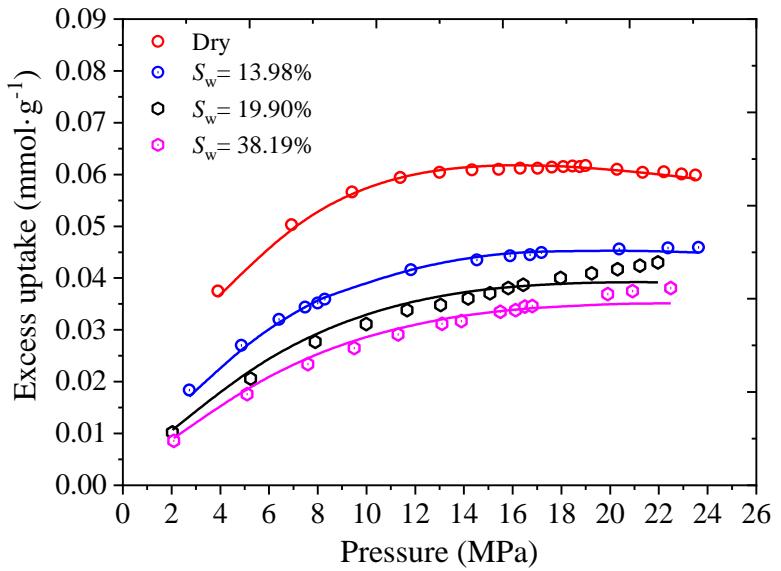
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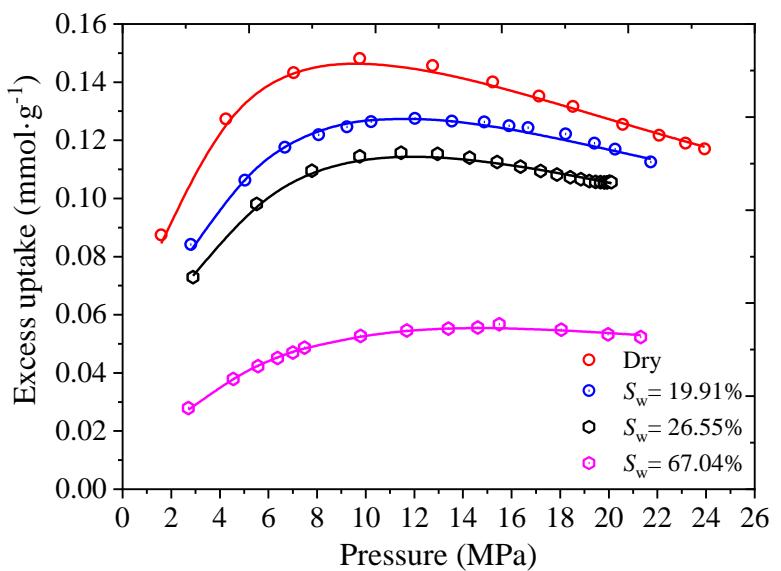
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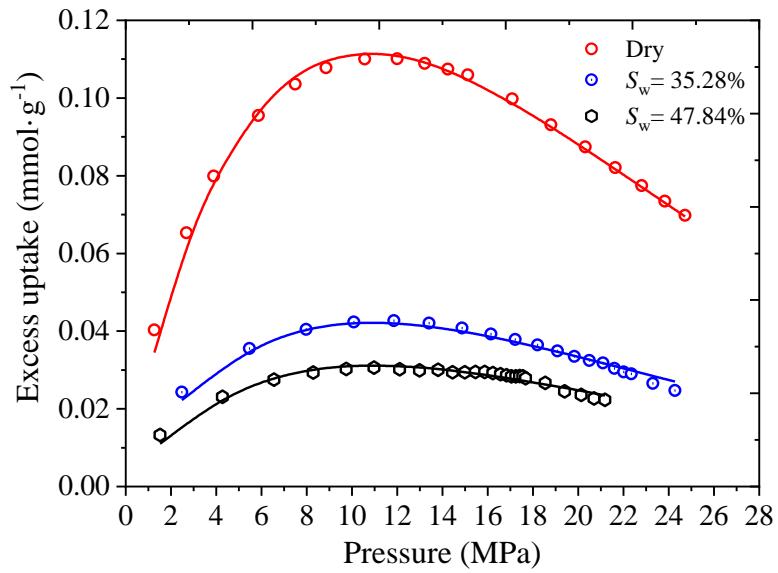


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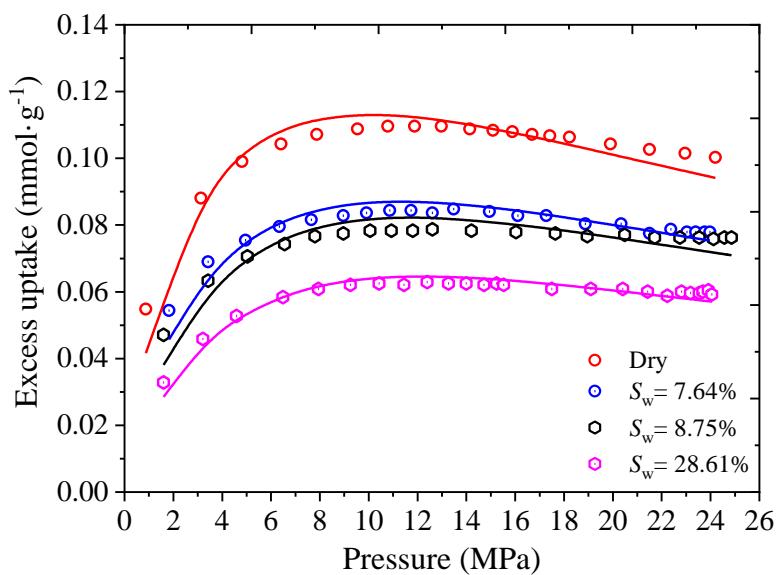
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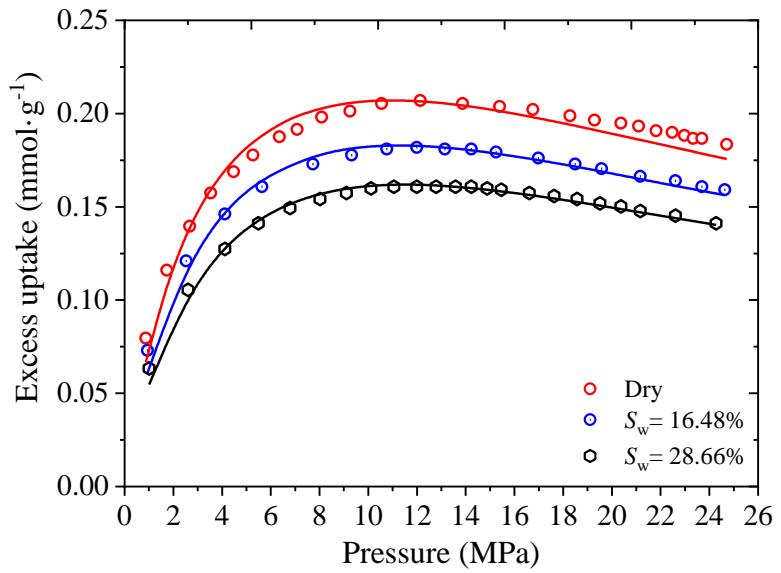
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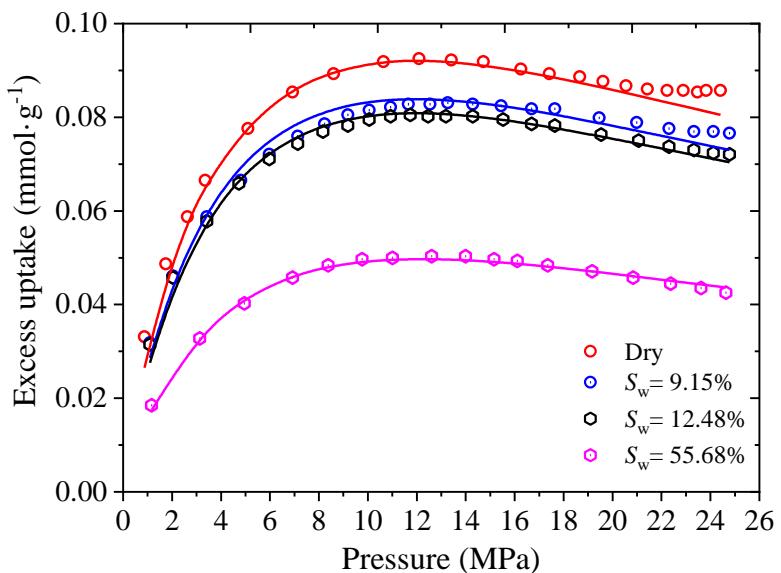
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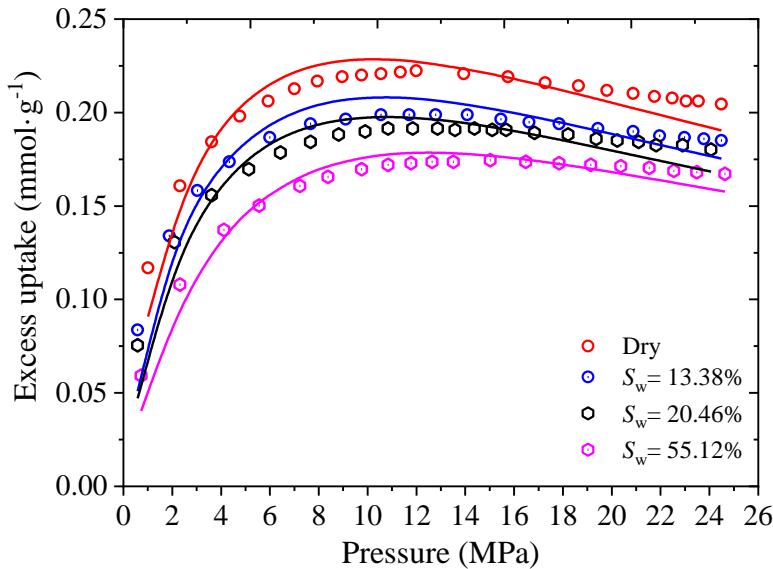
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(f)



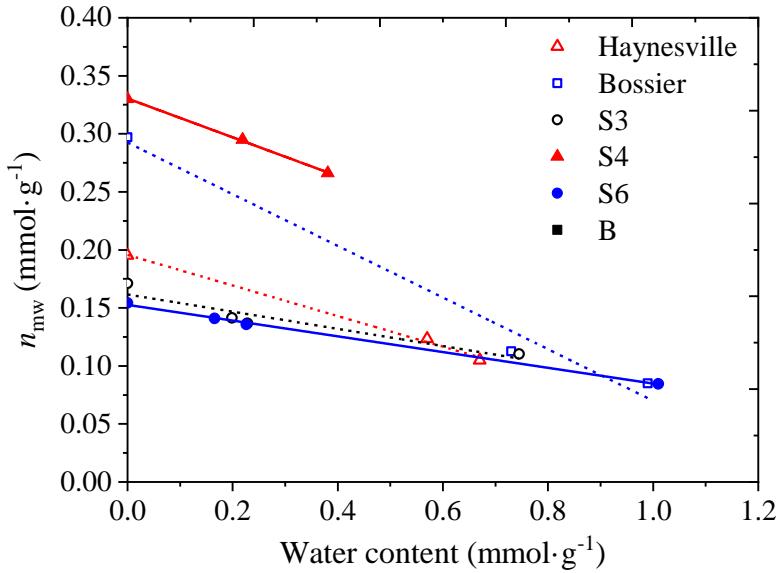
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(g)

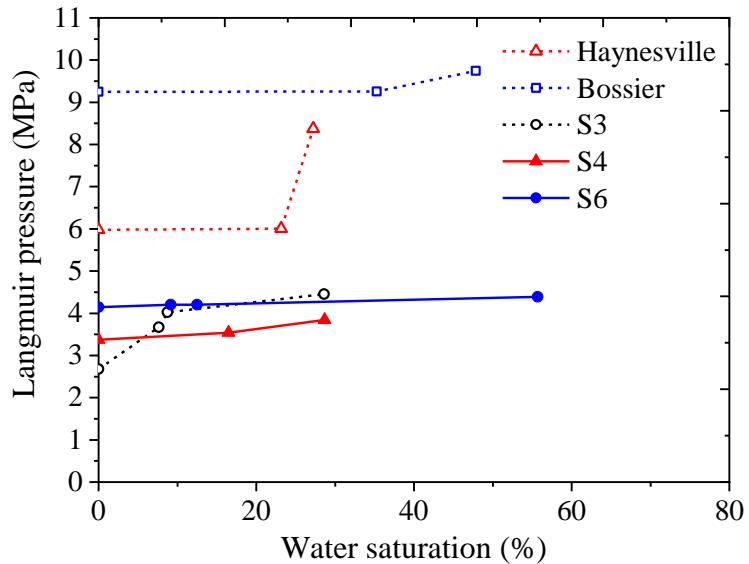
39 **Figure S1.** Modeling of high-pressure methane adsorption on wet shales. The symbols
 40 represent experimental data. The solid lines correspond to the modified Langmuir model,
 41 namely [eq 8](#). (a) Excess adsorption isotherms of sample CN_33 from Yang et al.^{[1](#)}. (b) Excess
 42 adsorption isotherms of sample CQ_14 from Yang et al.^{[1](#)}. (c) Excess adsorption isotherms of
 43 Bossier shale from Merkel et al.^{[2](#)}. (d) Excess adsorption isotherms of sample S3 from Shabani
 44 et al.^{[3](#)}. (e) Excess adsorption isotherms of sample S4 from Shabani et al.^{[3](#)}. (f) Excess adsorption
 45 isotherms of sample S6 from Shabani et al.^{[3](#)}. (g) Excess adsorption isotherms of sample S8
 46 from Shabani et al.^{[3](#)}.

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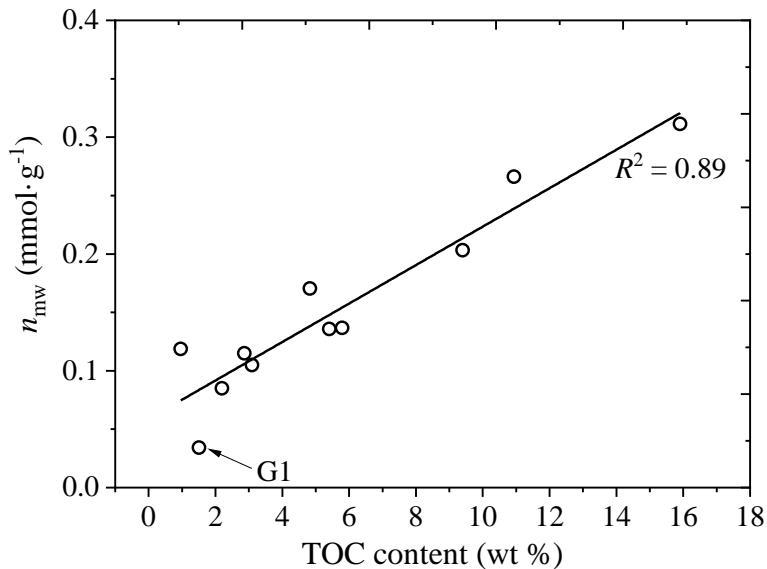
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49 **Figure S2.** Maximum methane adsorption capacity as a function of water content for the six
50 shales. The solid and shot dash lines are linear fitting curves. The symbols represent the fitting
51 results. n_{mw} is calculated by eq 9 using the parameters shown in Tables 1 and 2.



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53 **Figure S3.** Langmuir pressure as a function of water saturation for the shales. The symbols
54 represent the fitting results. The lines are guide to eyes.



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56 **Figure S4.** Maximum methane adsorption capacity as a function of TOC content at 53% RH.

57 The symbols denote the fitting results. n_{mw} is calculated by [eq 9](#) using the parameters shown in

58 [Tables 1](#) and [2](#). The lines are linear fitting curves.

59 **Reference**

60 (1) Yang, F.; Xie, C.; Ning, Z.; Krooss, B. M., High-pressure methane sorption on dry and
61 moisture-equilibrated shales. *Energ. Fuel.* **2017**, 31 (1), 482-492.

62 (2) Merkel, A.; Fink, R.; Littke, R., The role of pre-adsorbed water on methane sorption
63 capacity of Bossier and Haynesville shales. *Int. J. Coal. Geol.* **2015**, 147-148 (1), 1-8.

64 (3) Shabani, M.; Moallemi, S. A.; Krooss, B. M.; Amann-Hildenbrand, A.; Zamani-Pozveh,
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