

*Appendix E*DYNAMIC STORAGE AND LOSS MODULI OF LIQUID
CRYSTALLINE POLYMER SOLUTIONS

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E.1 Appendix

A TA Instruments ARES-RFS fluids rheometer was used to measure the dynamic storage modulus, $G'(\omega)$, and loss modulus, $G''(\omega)$, of solutions of side-group liquid crystalline diblock copolymers, triblock copolymers, and homopolymers dissolved in nematic liquid crystal solvent, 4-pentyl-4'-cyanobiphenyl (5CB). Temperature was controlled with the rheometer's built-in Peltier plate, and before beginning a frequency sweep, the sample was heated to 60 °C then annealed at the desired temperature for at least five minutes. A 25 mm titanium cone-and-plate tool with a cone angle of 0.04 rad was used, which requires approximately 250 mg of sample.

E.2 Figures

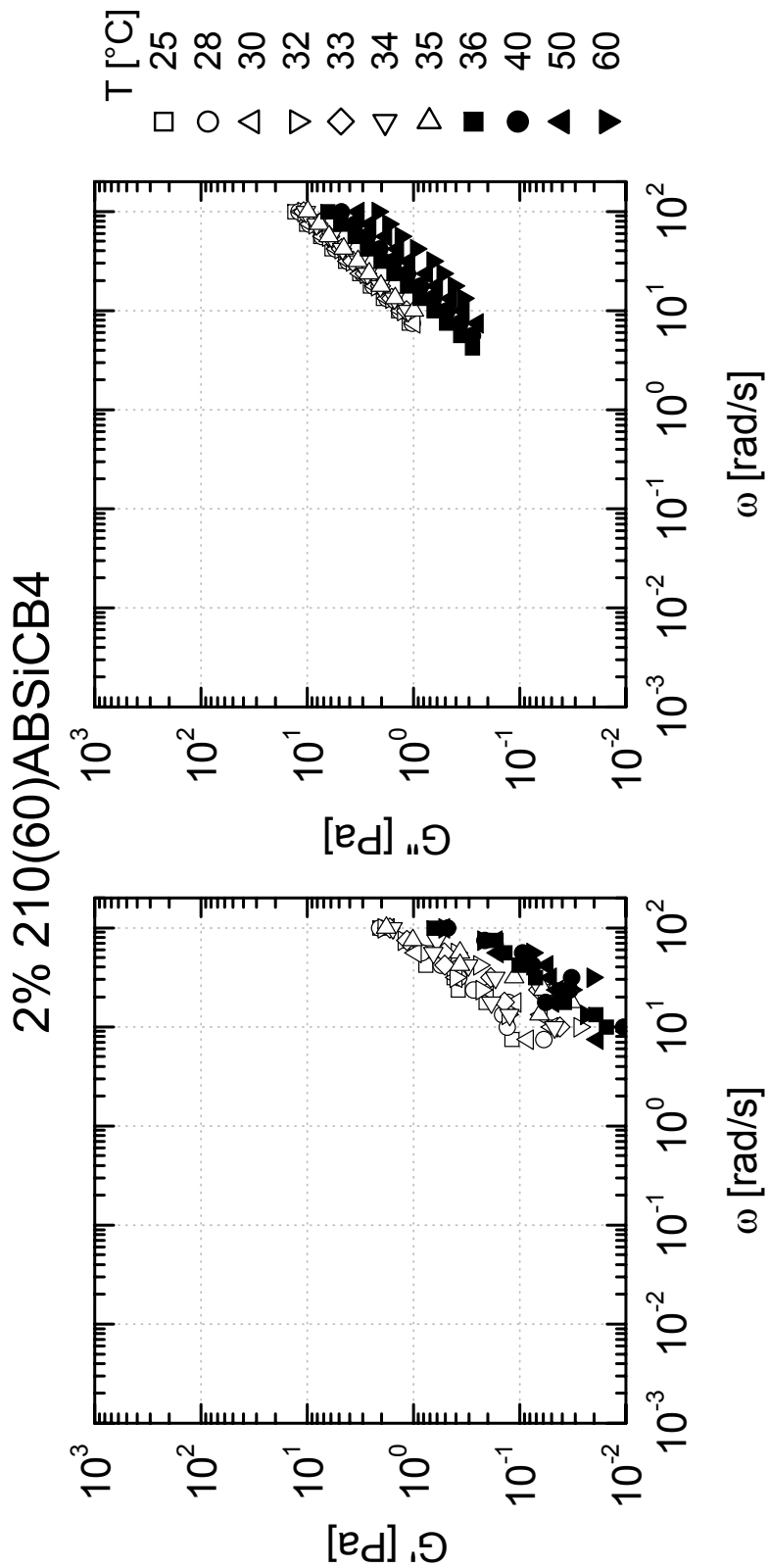


Figure E.1 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 210(60)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

2% 700(70)ABSiCB4

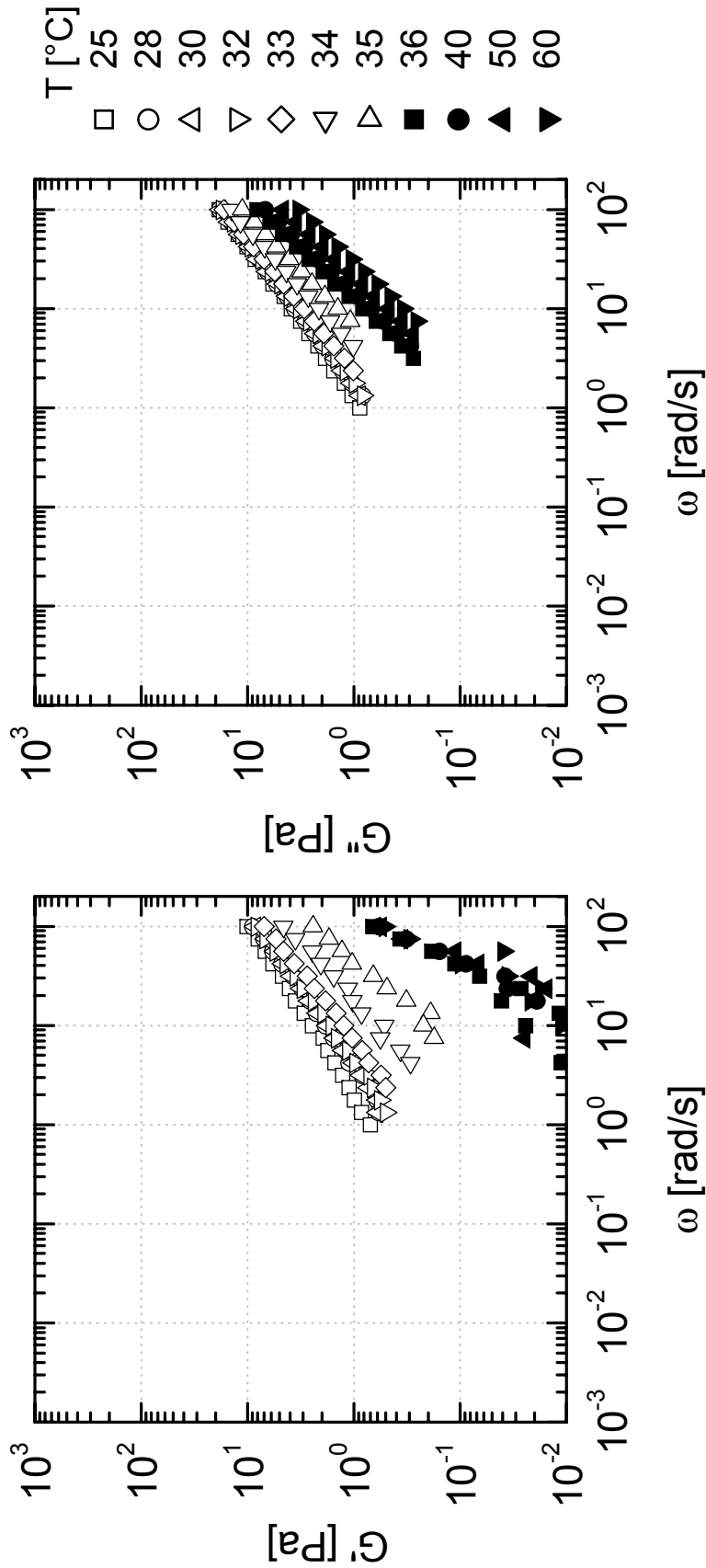


Figure E.2 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 700(70)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

2% 580(190)ABSiCB4

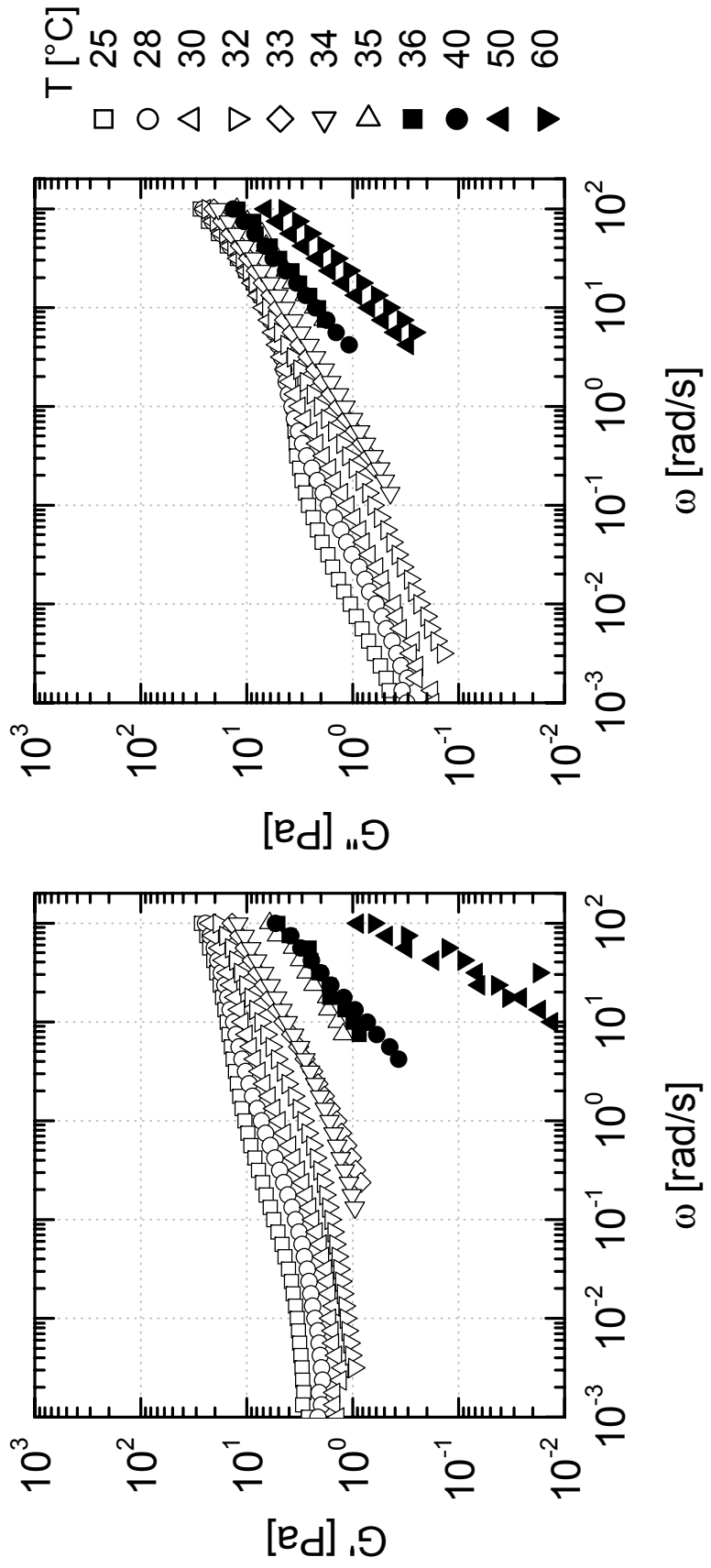


Figure E.3 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 580(190)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 210(60)ABSiCB4

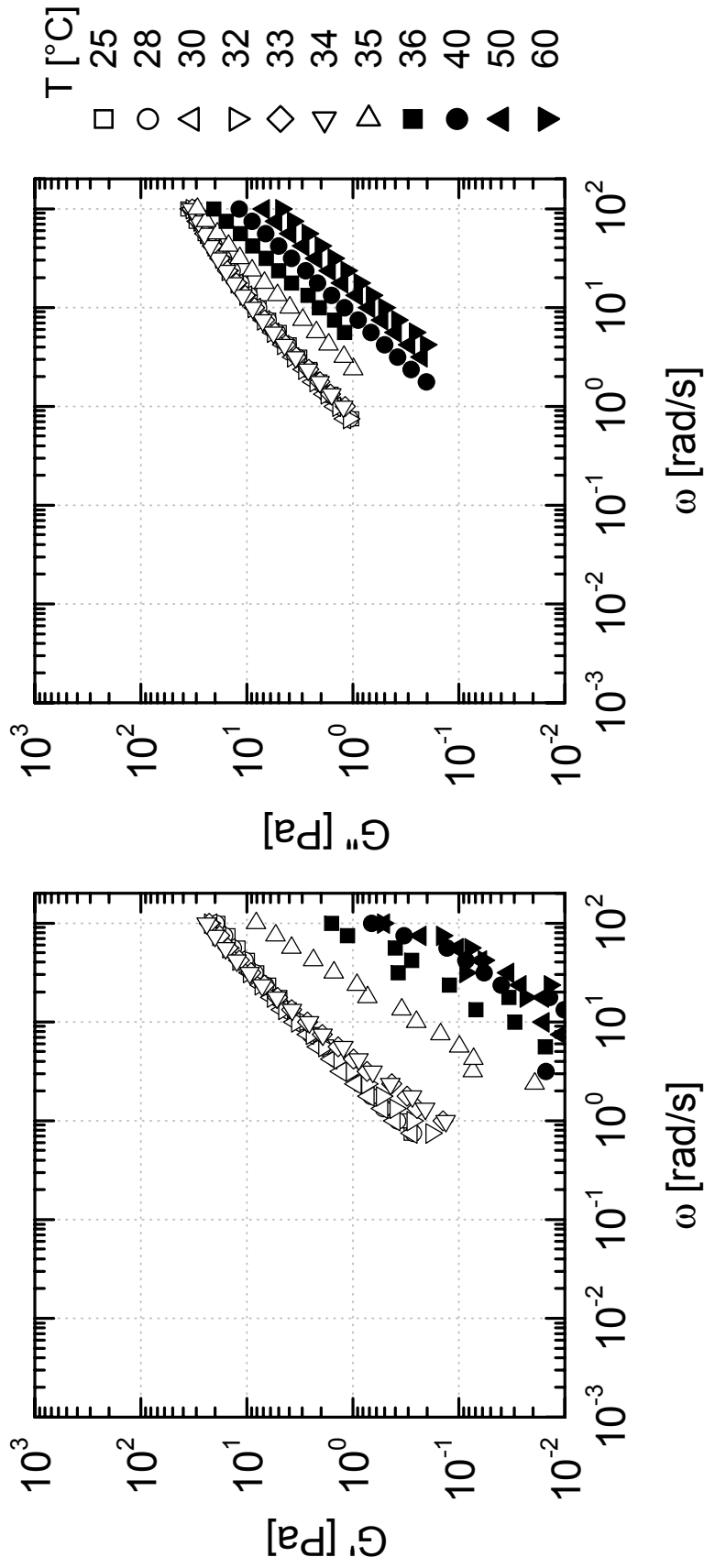


Figure E.4 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 210(60)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

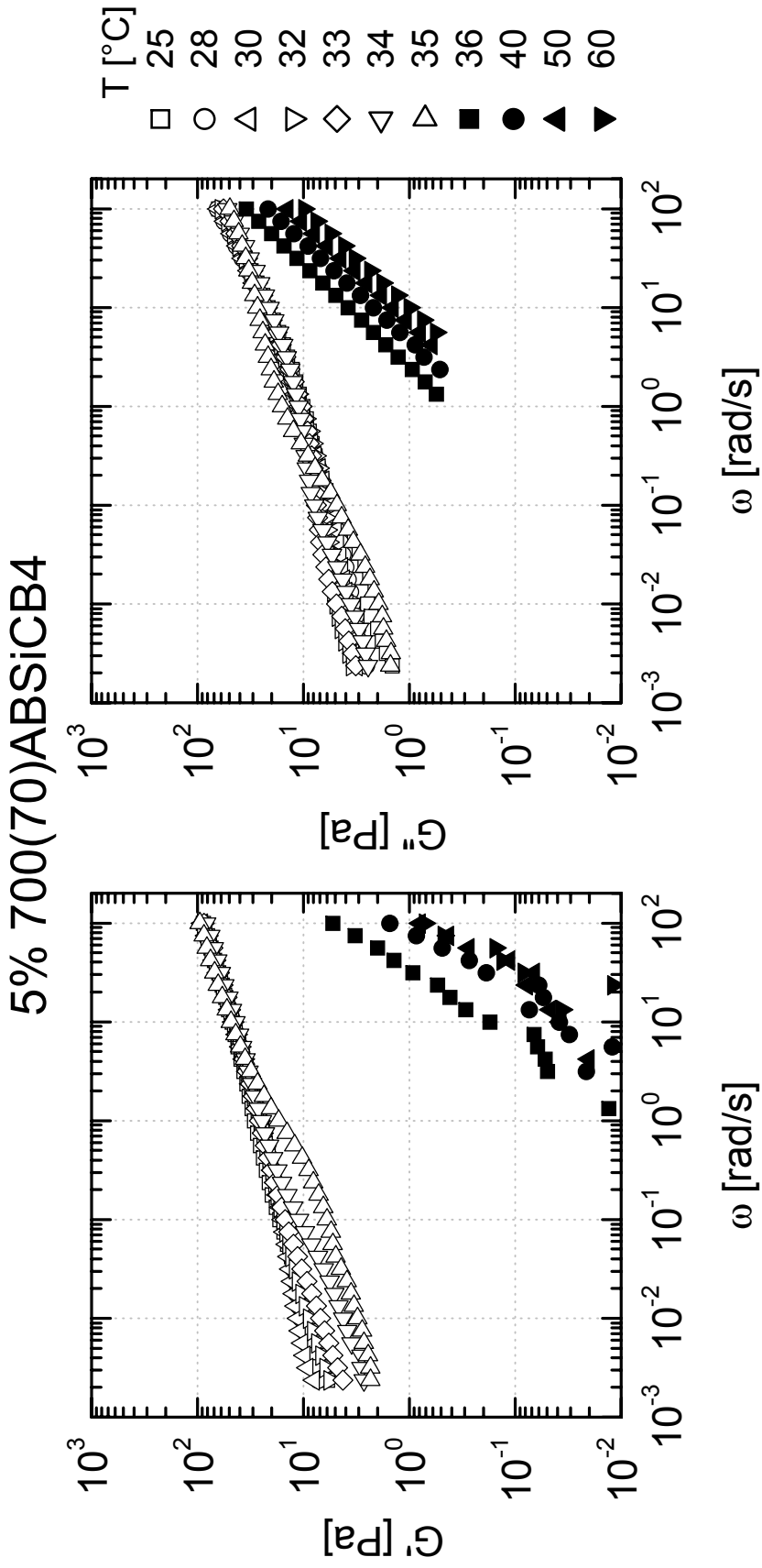


Figure E.5 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 700(70)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 580(190)ABSiCB4

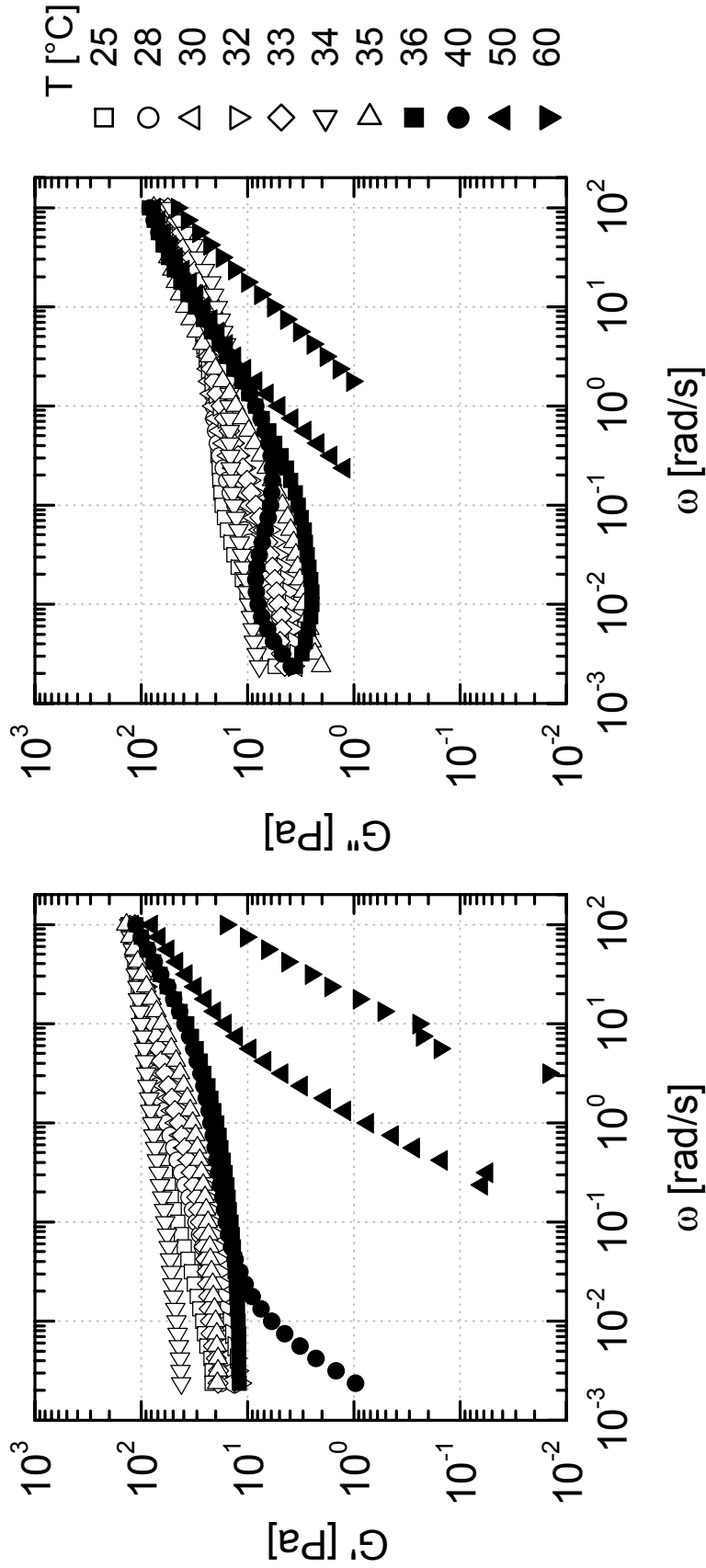


Figure E.6 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 580(190)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 470(40)ABSiCB4

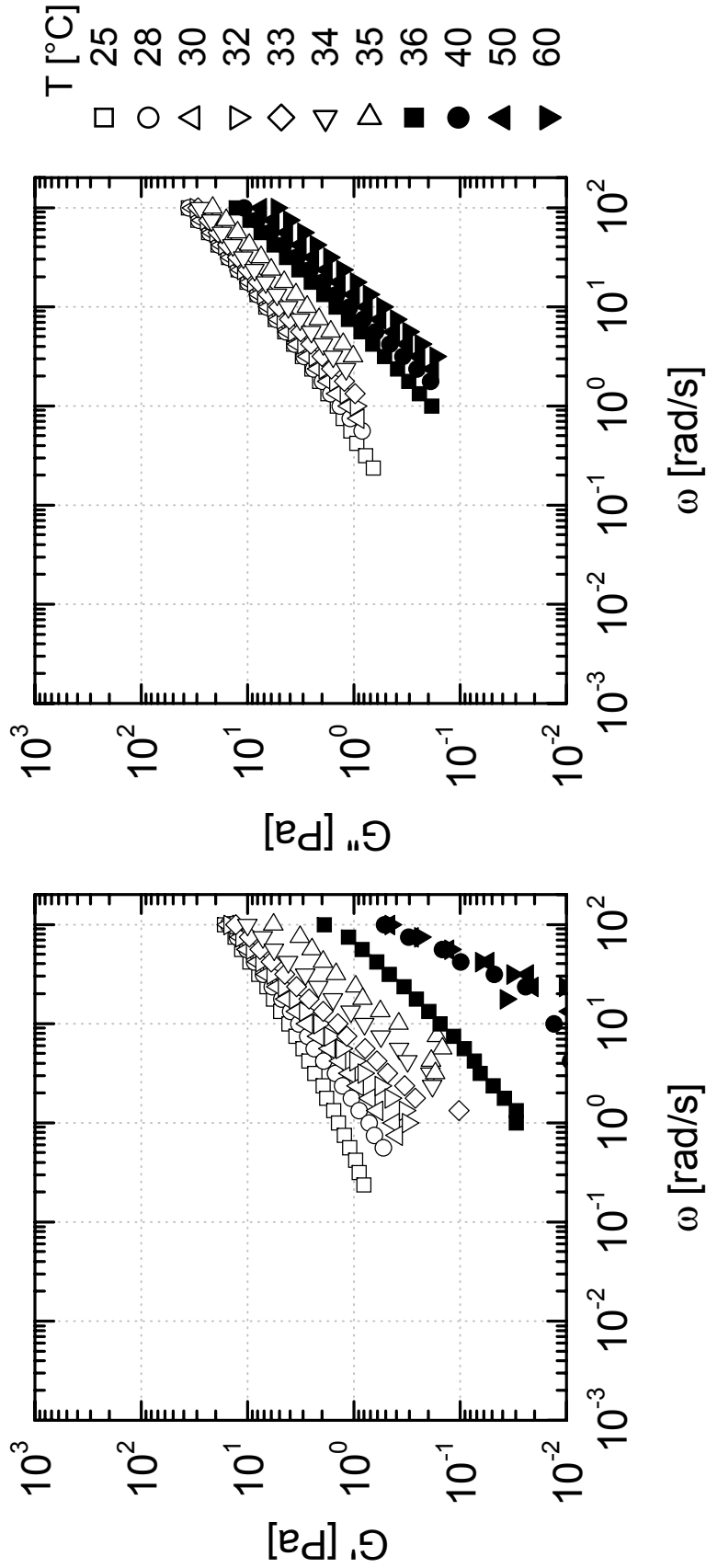


Figure E.7 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 470(40)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 390(60)ABSiCB4

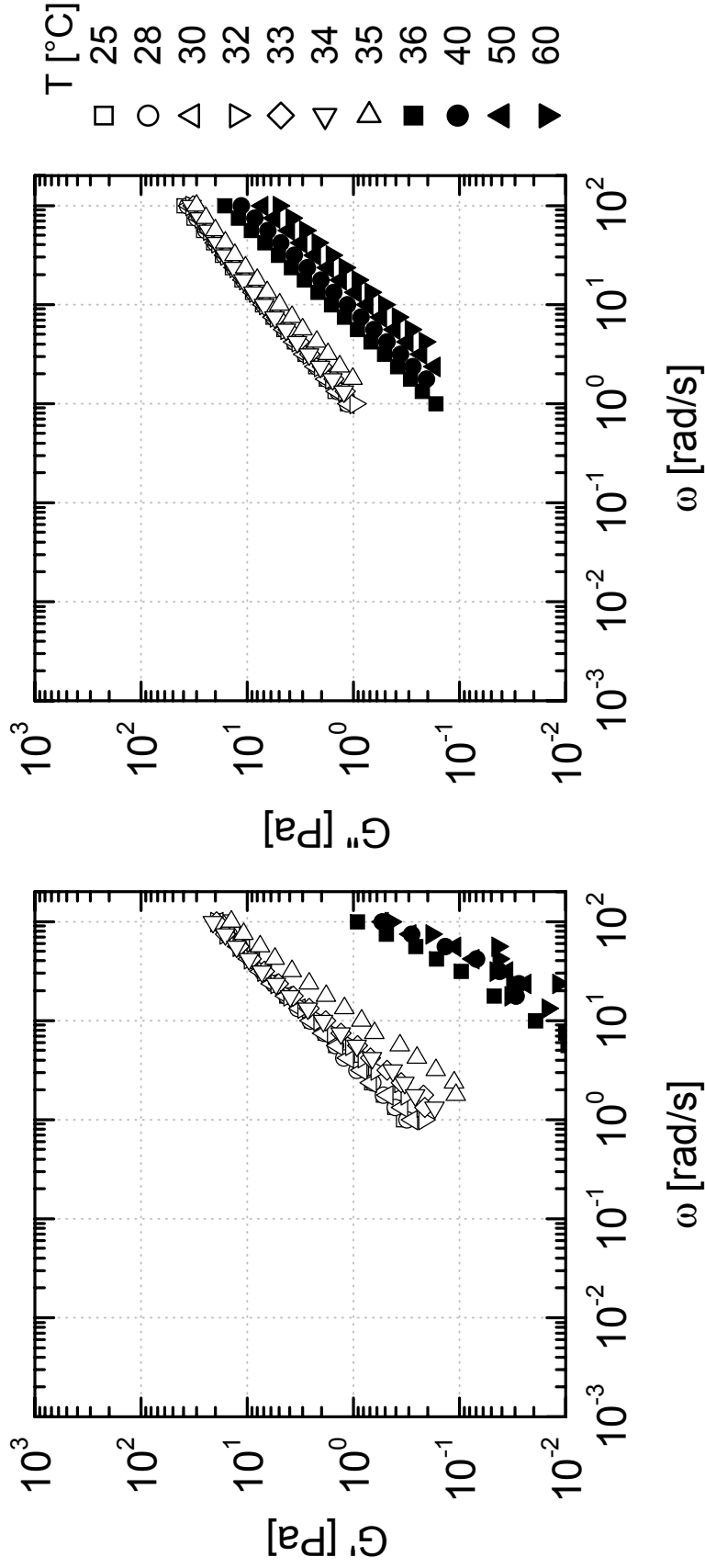


Figure E.8 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 390(60)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 420(80)ABSiCB4

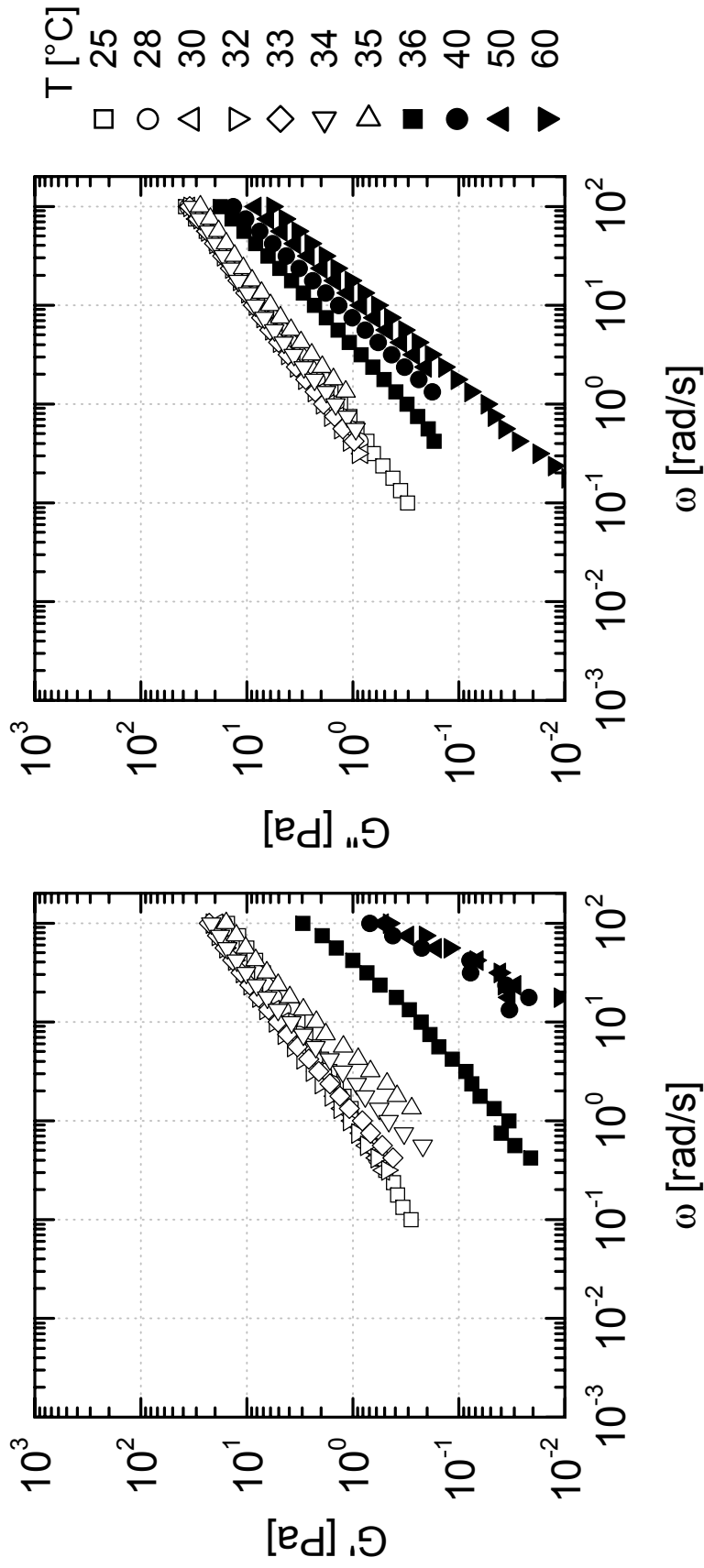


Figure E.9 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 420(80)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

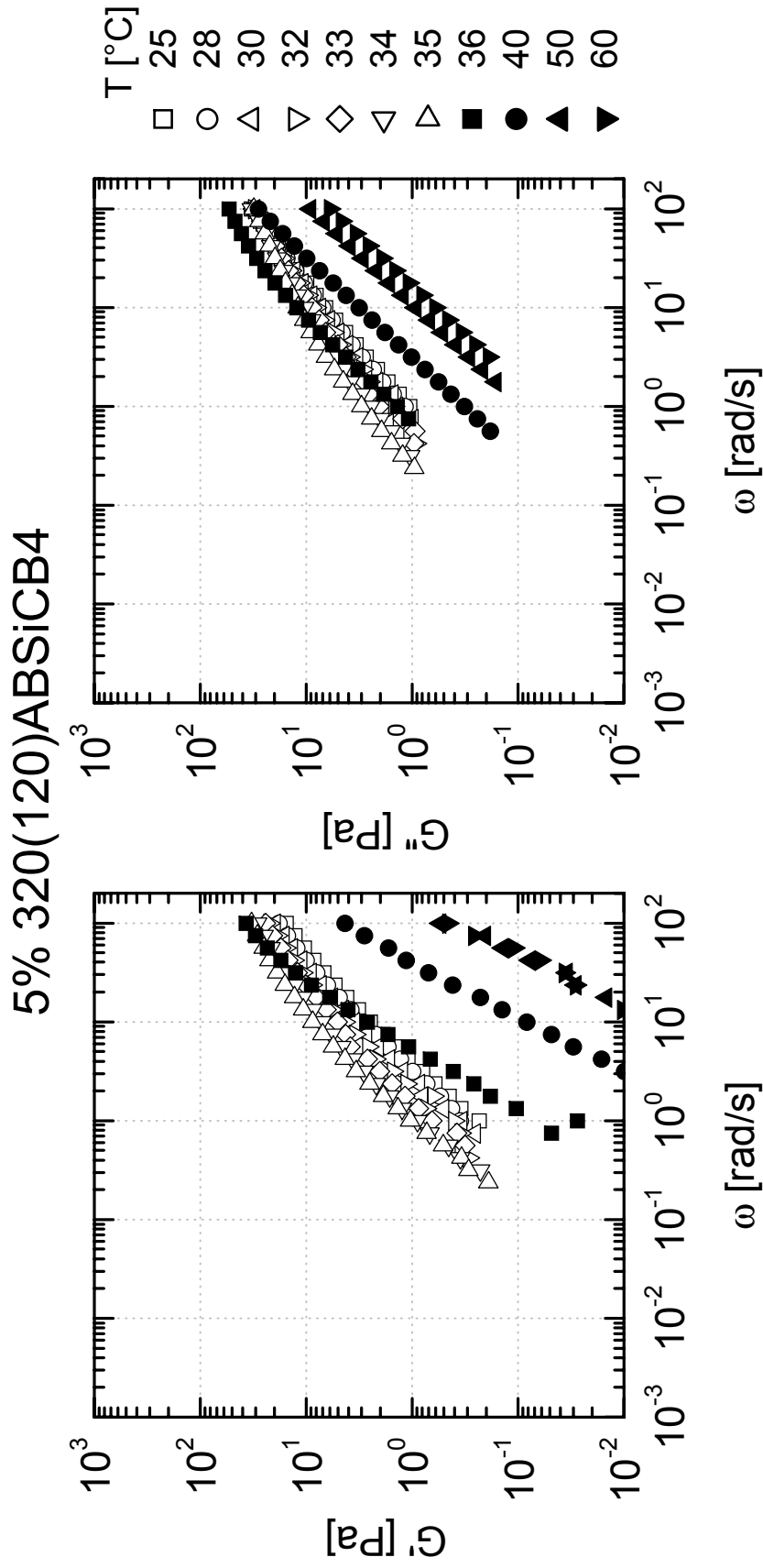


Figure E.10 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 320(120)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

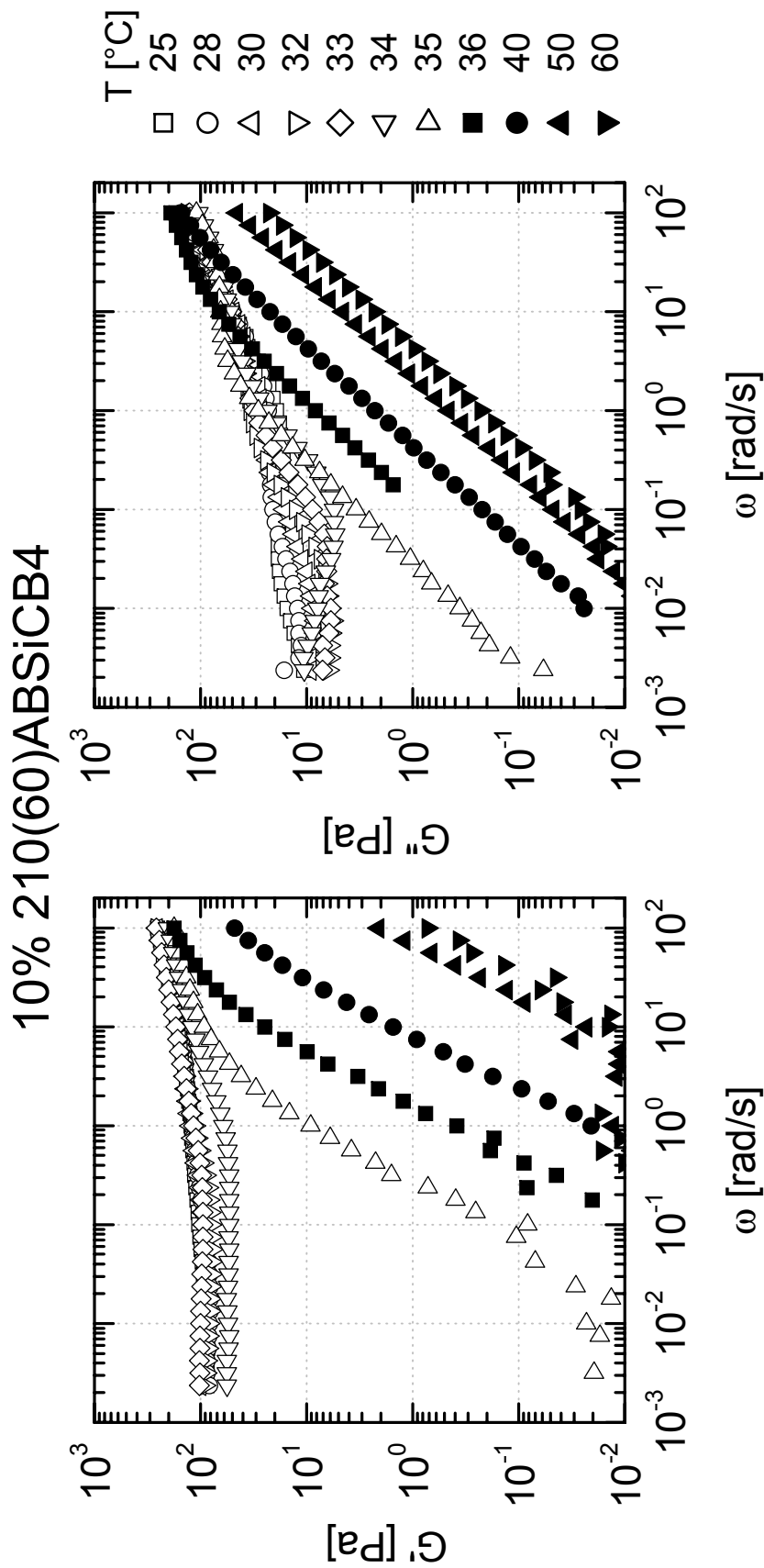


Figure E.11 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 210(60)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

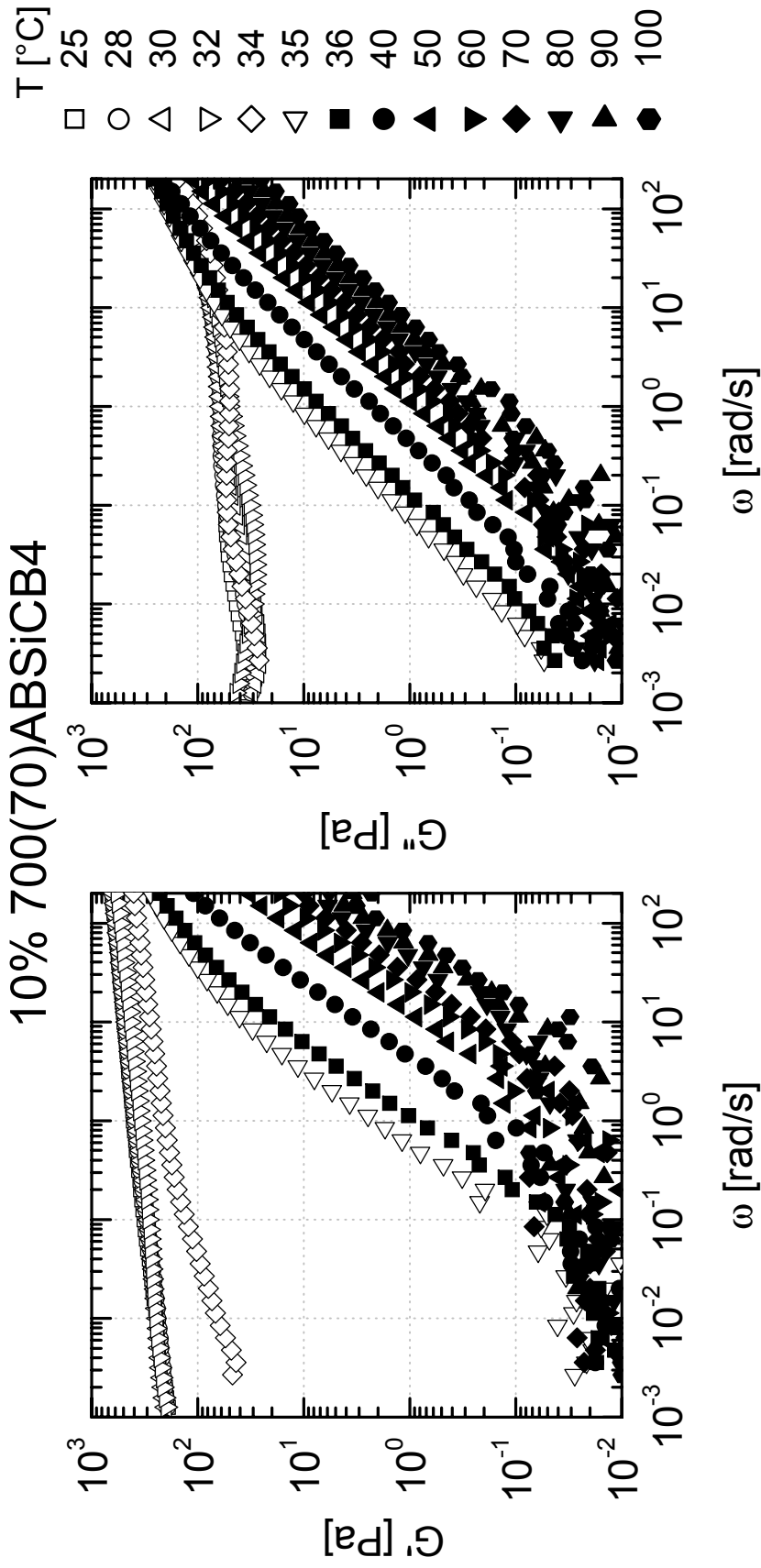


Figure E.12 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 700(70)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

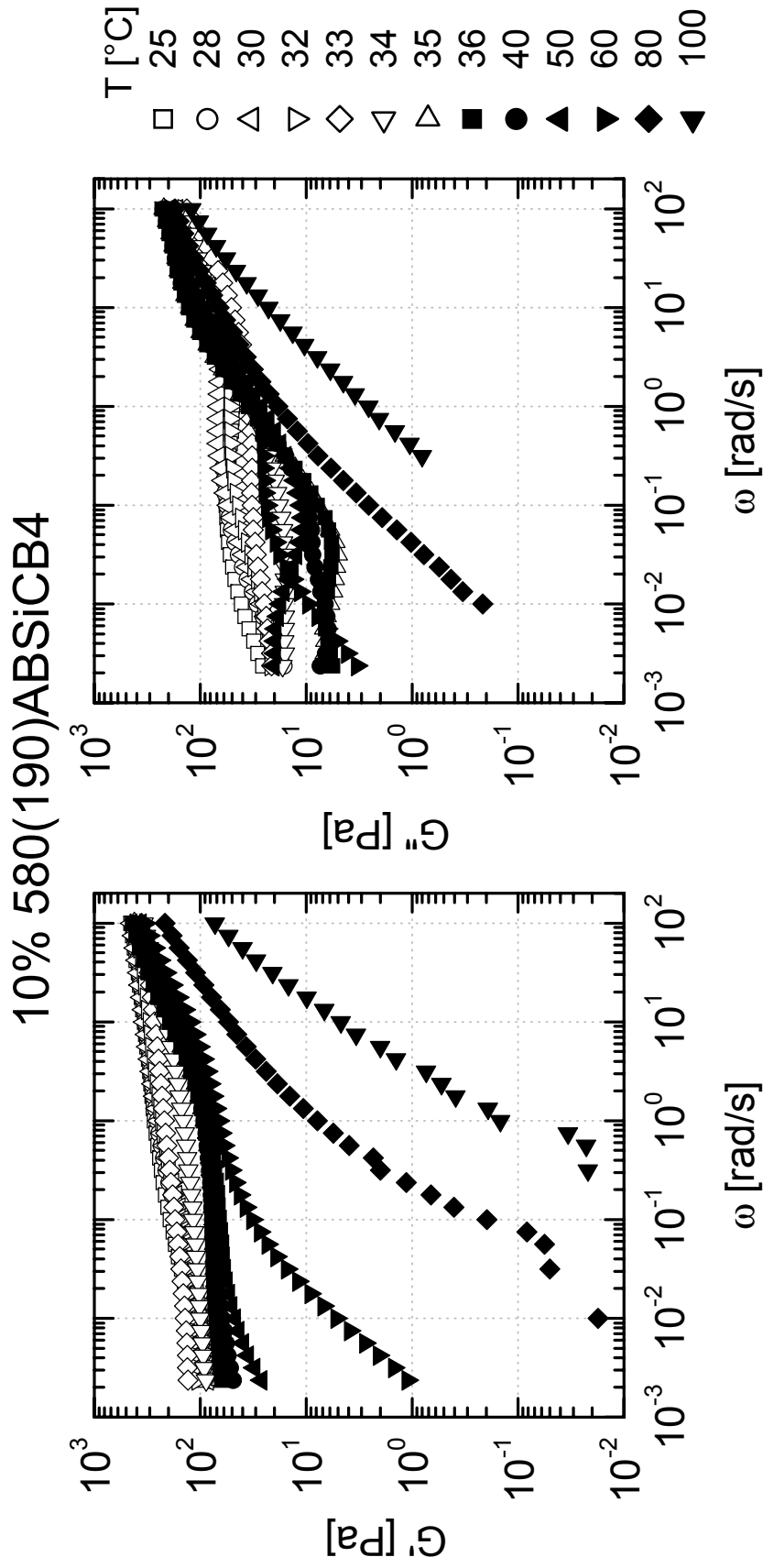


Figure E.13 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 580(190)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

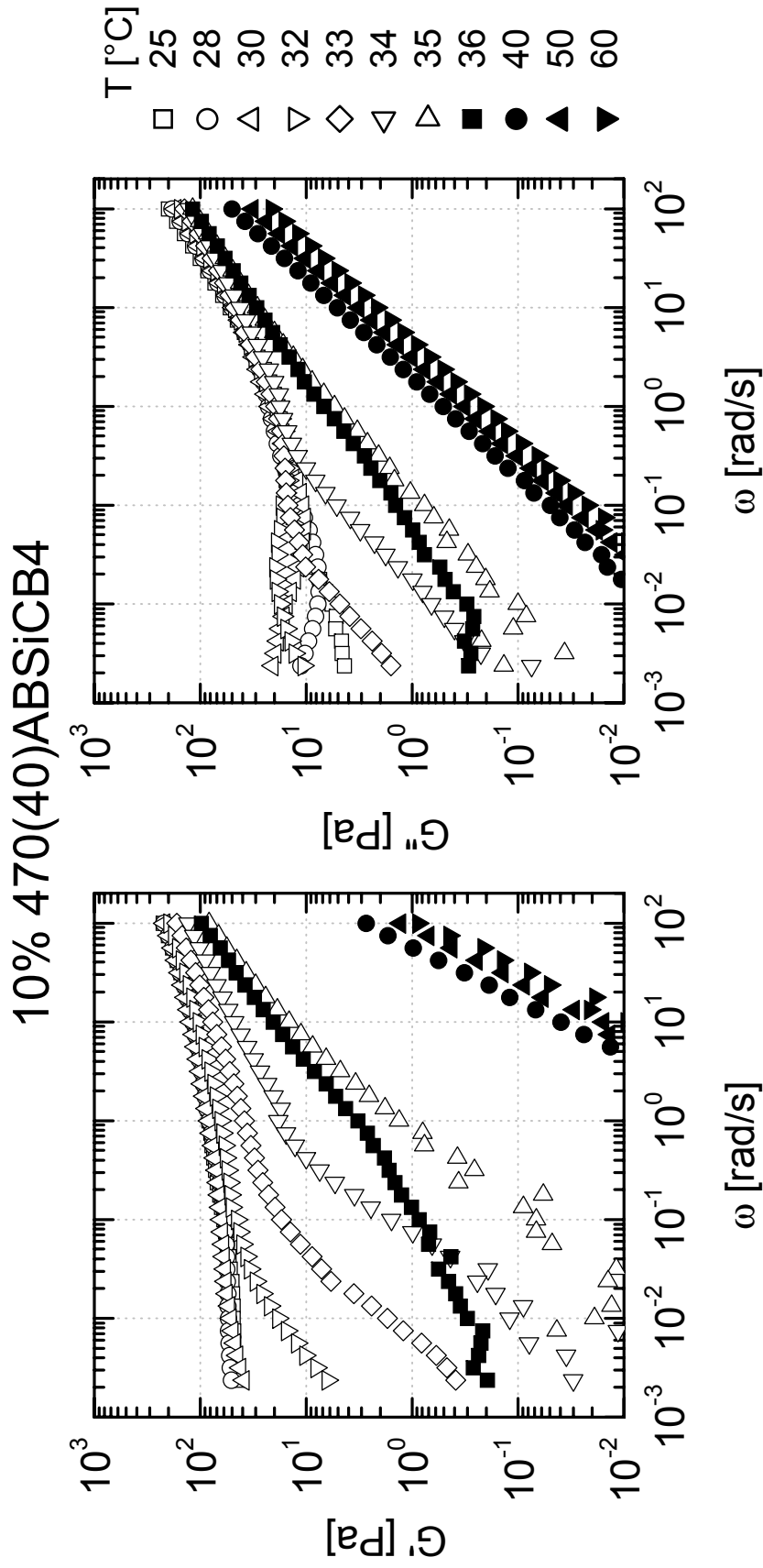


Figure E.14 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 470(40)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

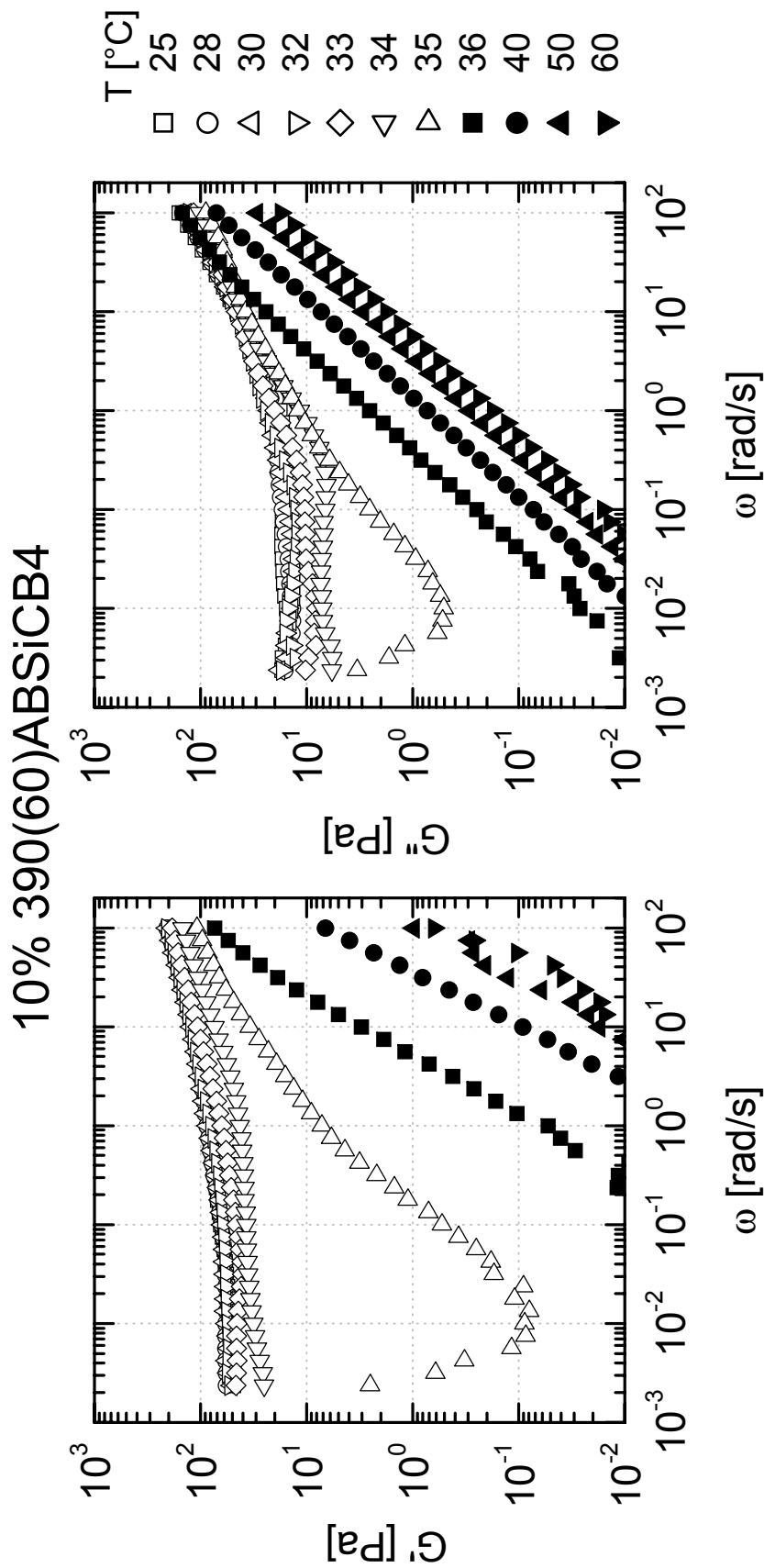


Figure E.15 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 390(60)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

10% 420(80)ABSiCB4

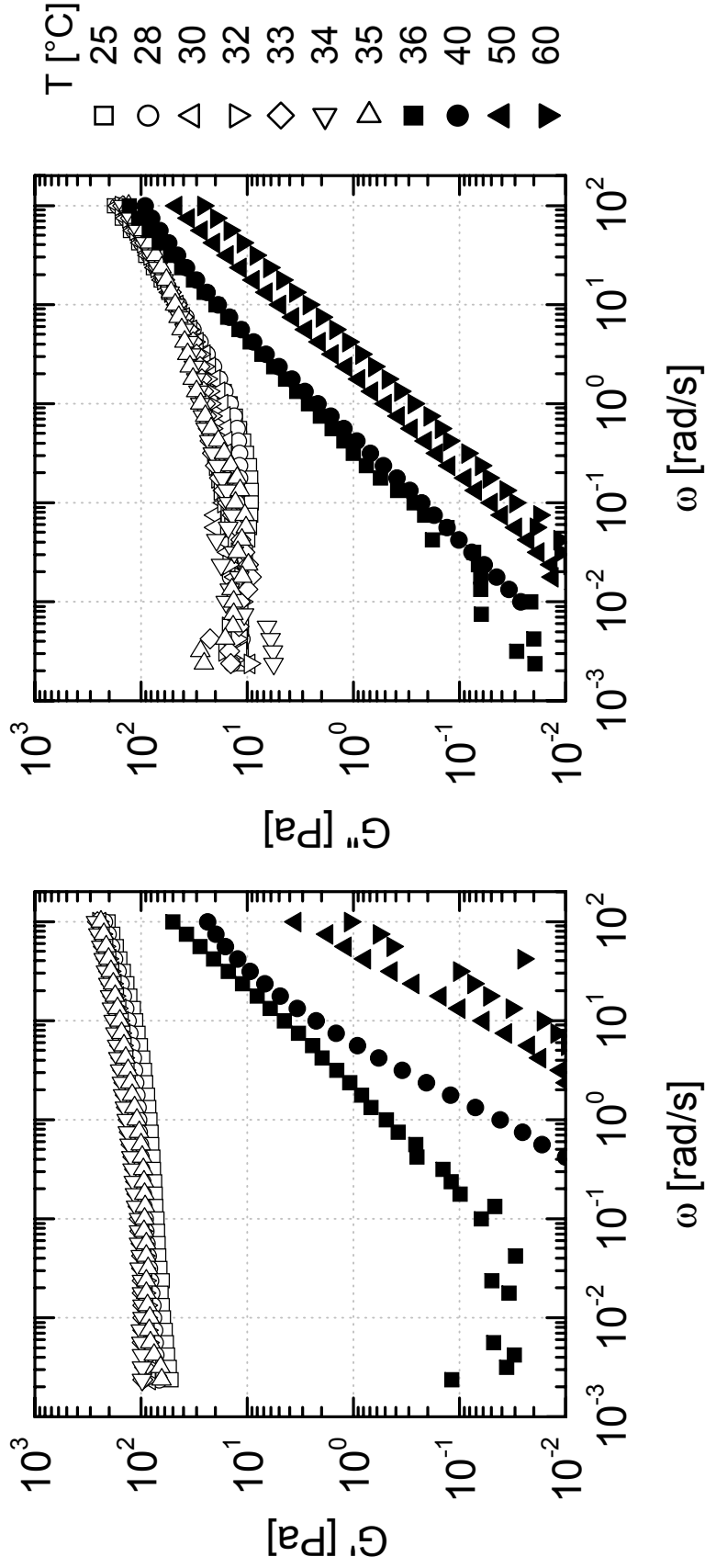


Figure E.16 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 420(80)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

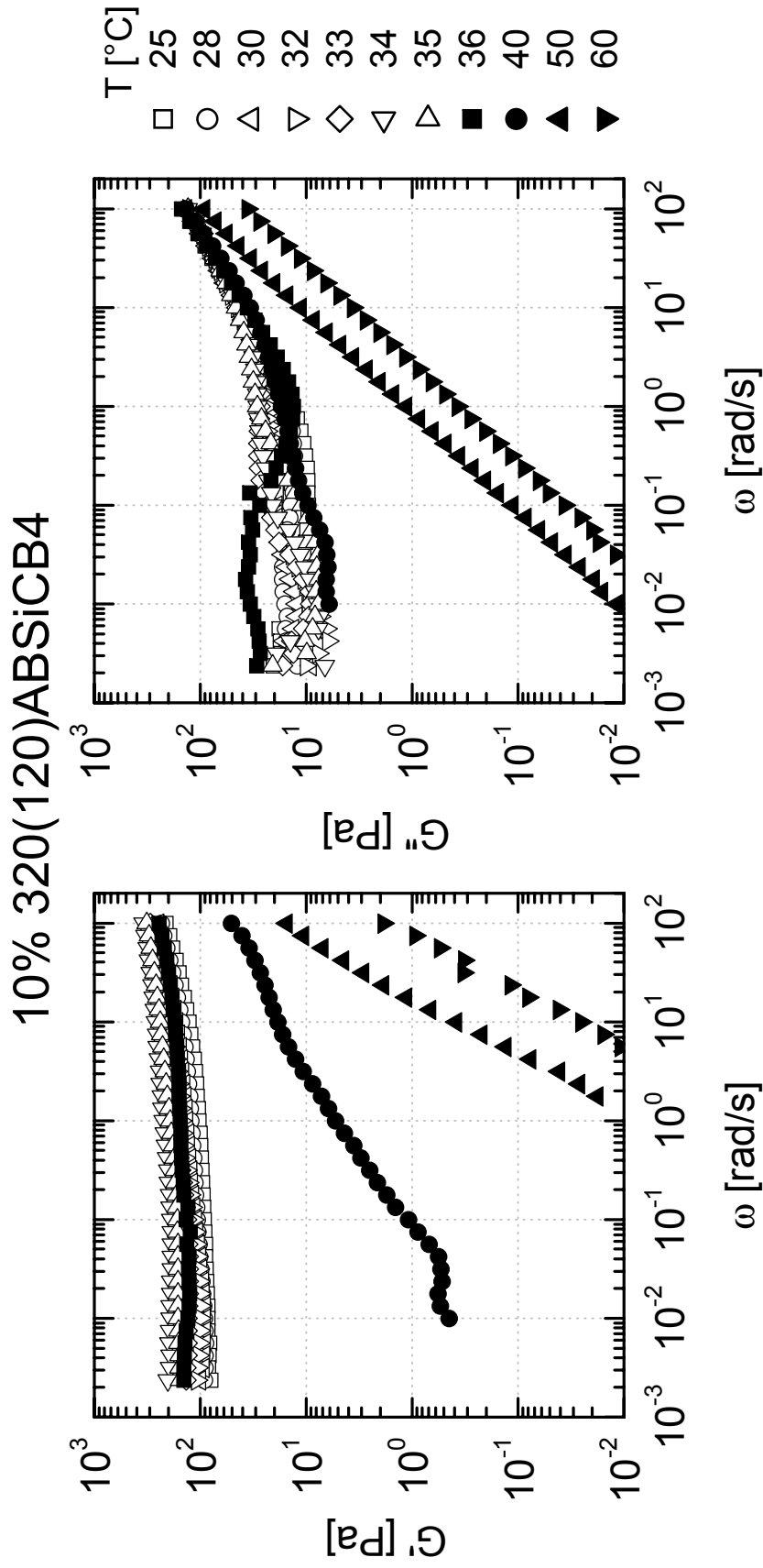


Figure E.17 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 320(120)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

20% 210(60)ABSiCB4

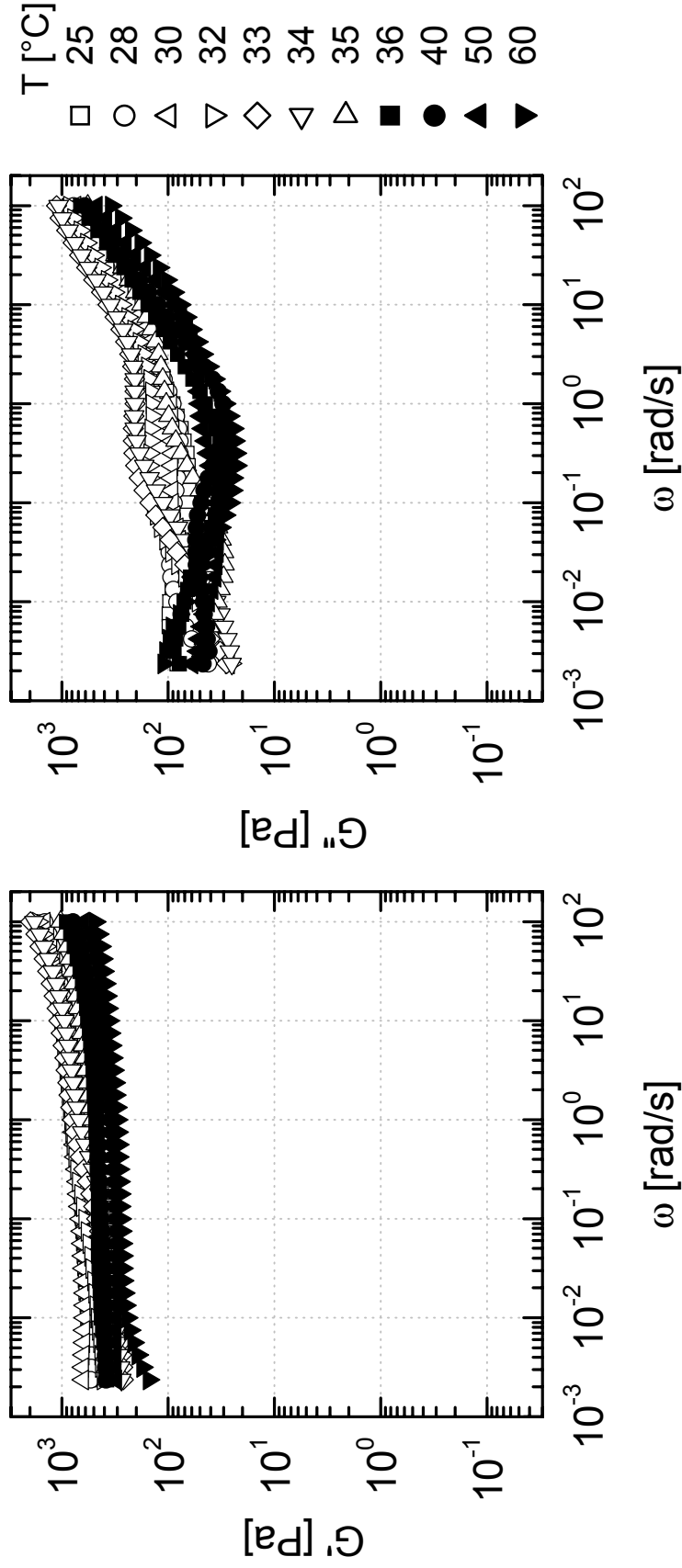


Figure E.18 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 20 wt % 210(60)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

20% 700(70)ABSiCB4

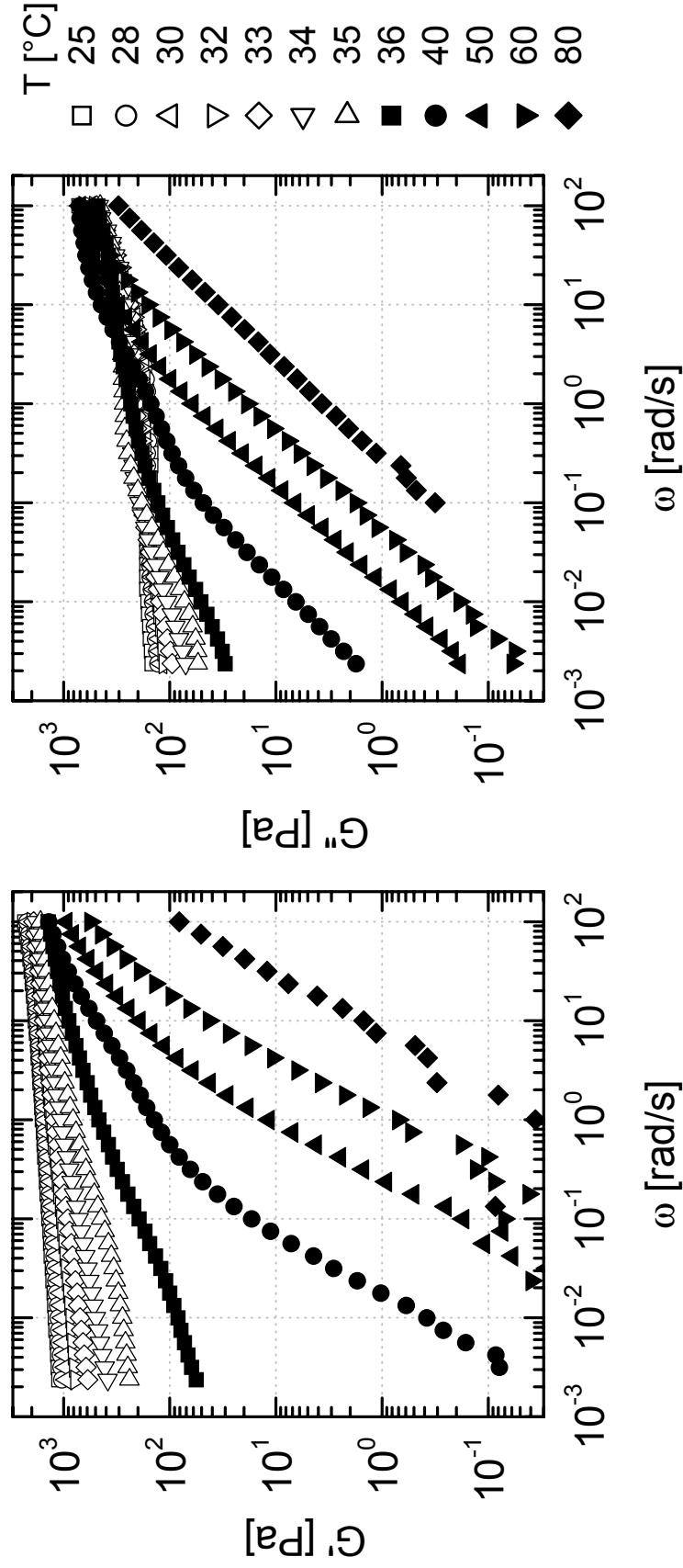


Figure E.19 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 20 wt % 700(70)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

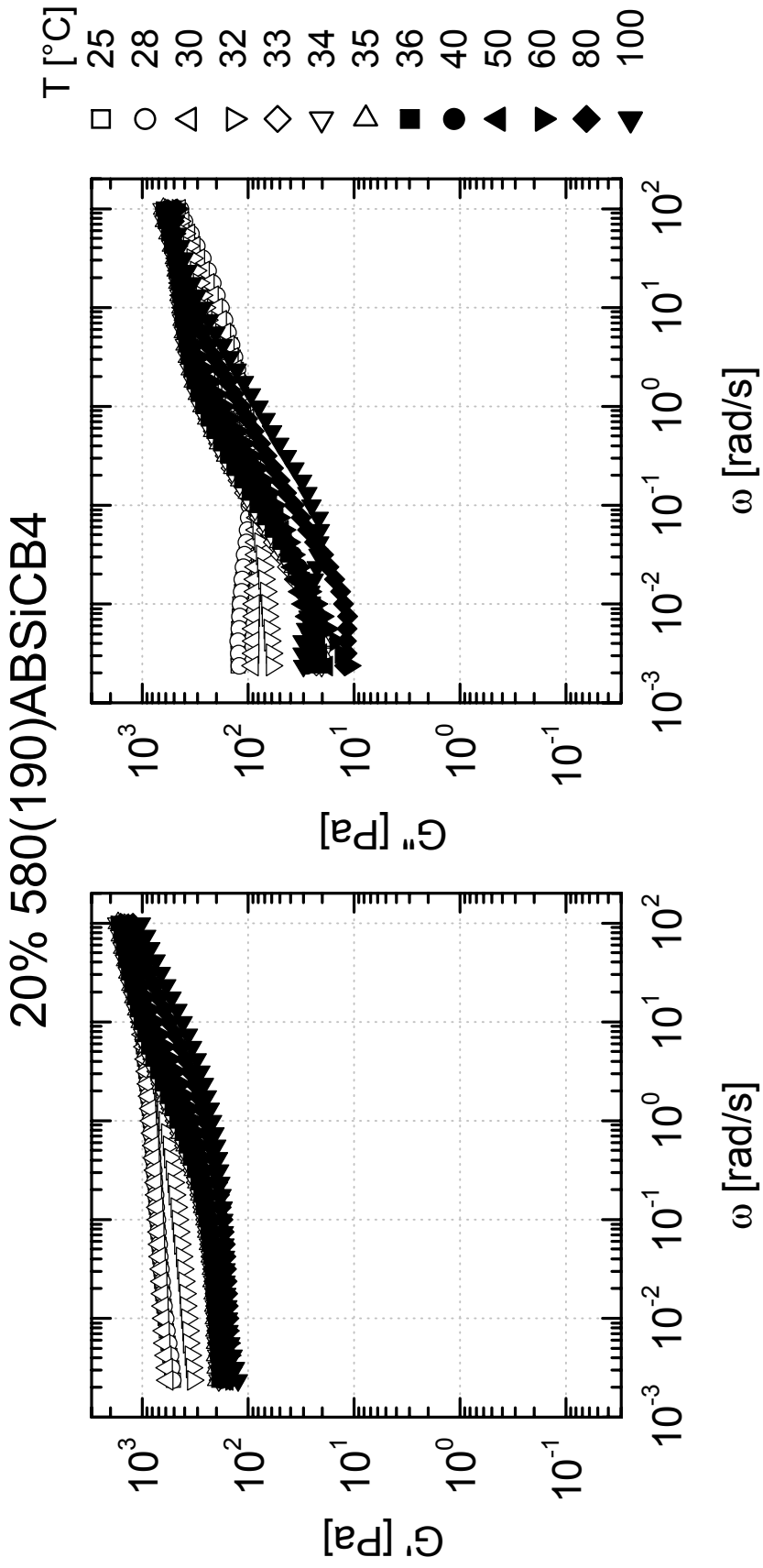


Figure E.20 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 20 wt % 580(190)ABSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

2% 950(70)BdMMASiCB4

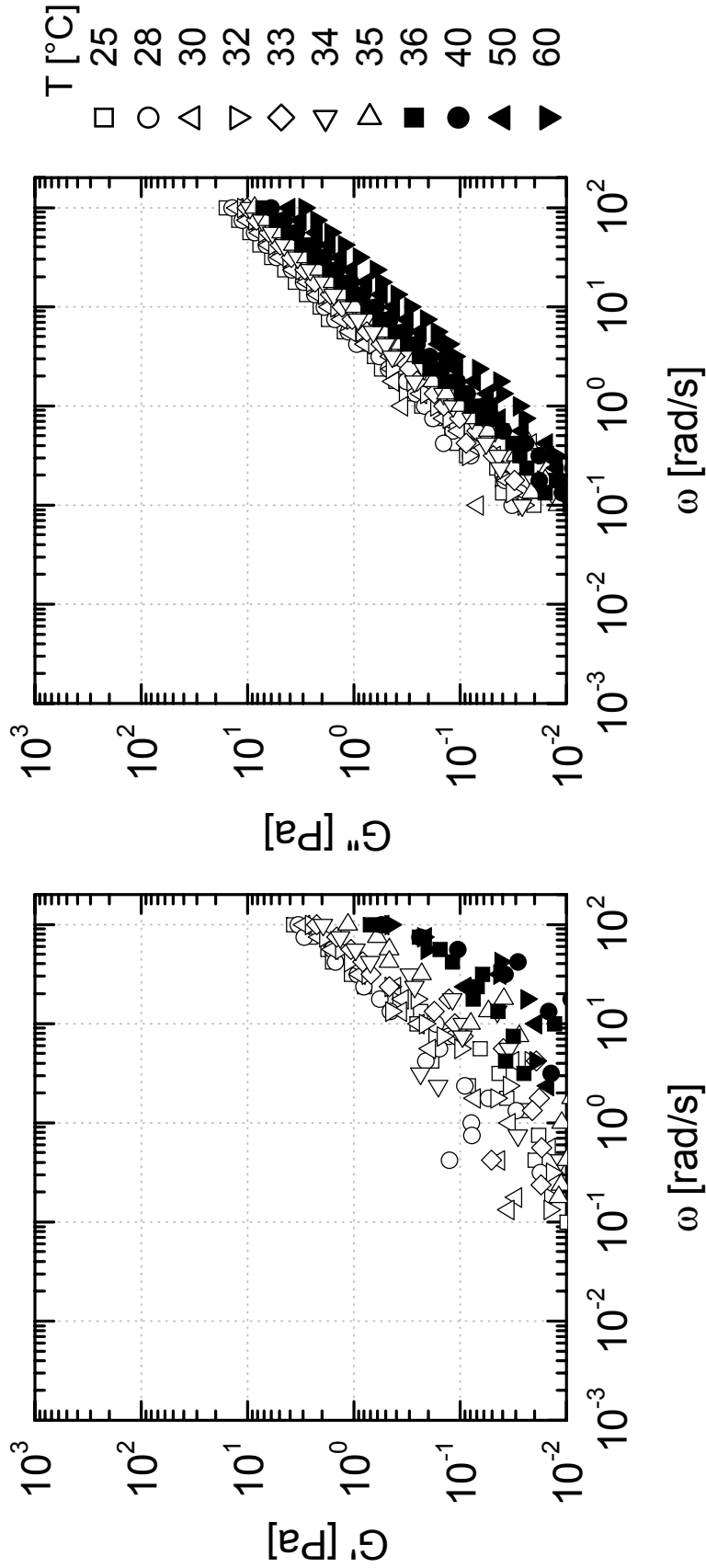


Figure E.21 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 950BdMMASiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

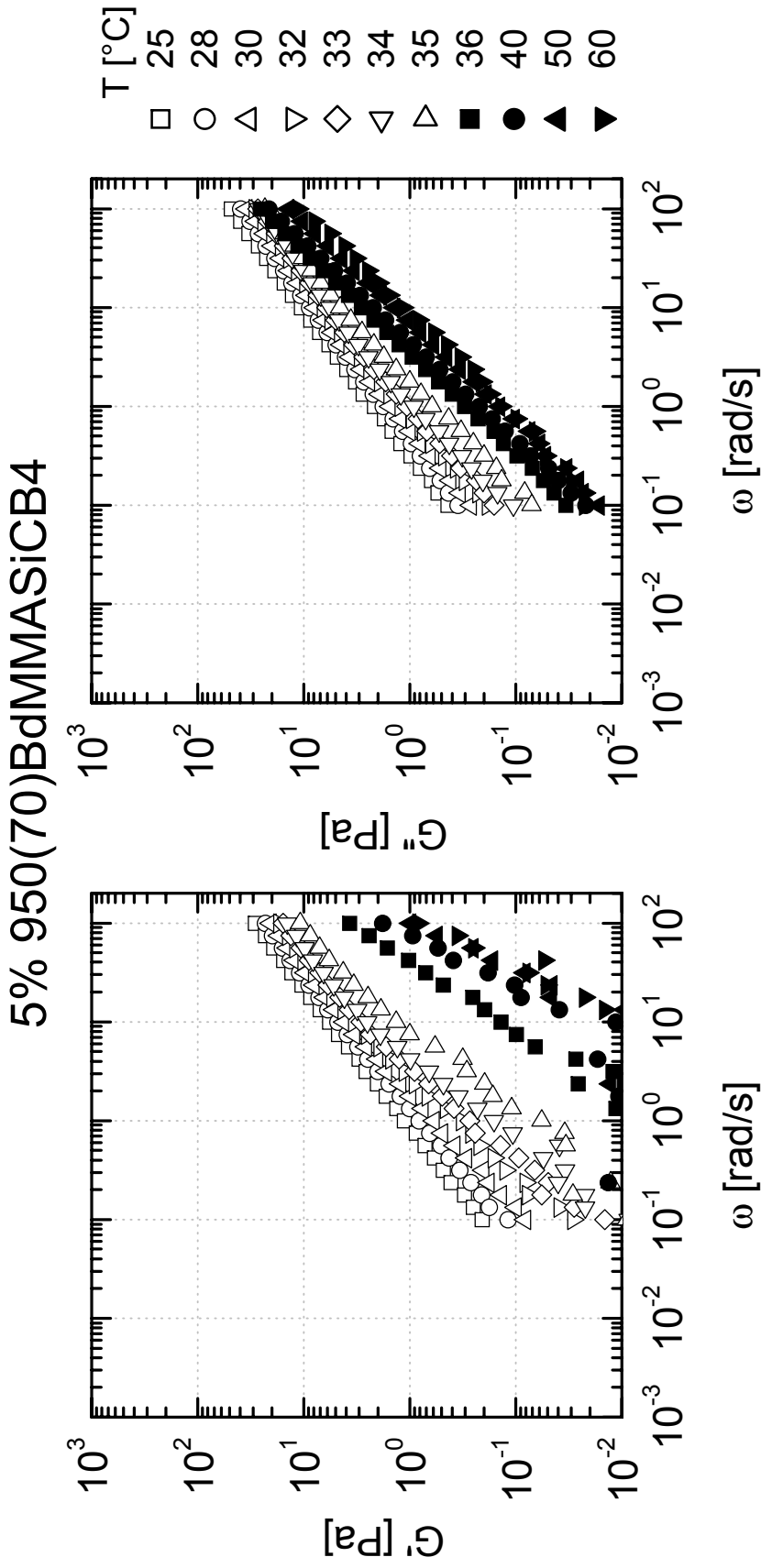


Figure E.22 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 950BdMMASiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

10% 950(70)BdMMASiCB4

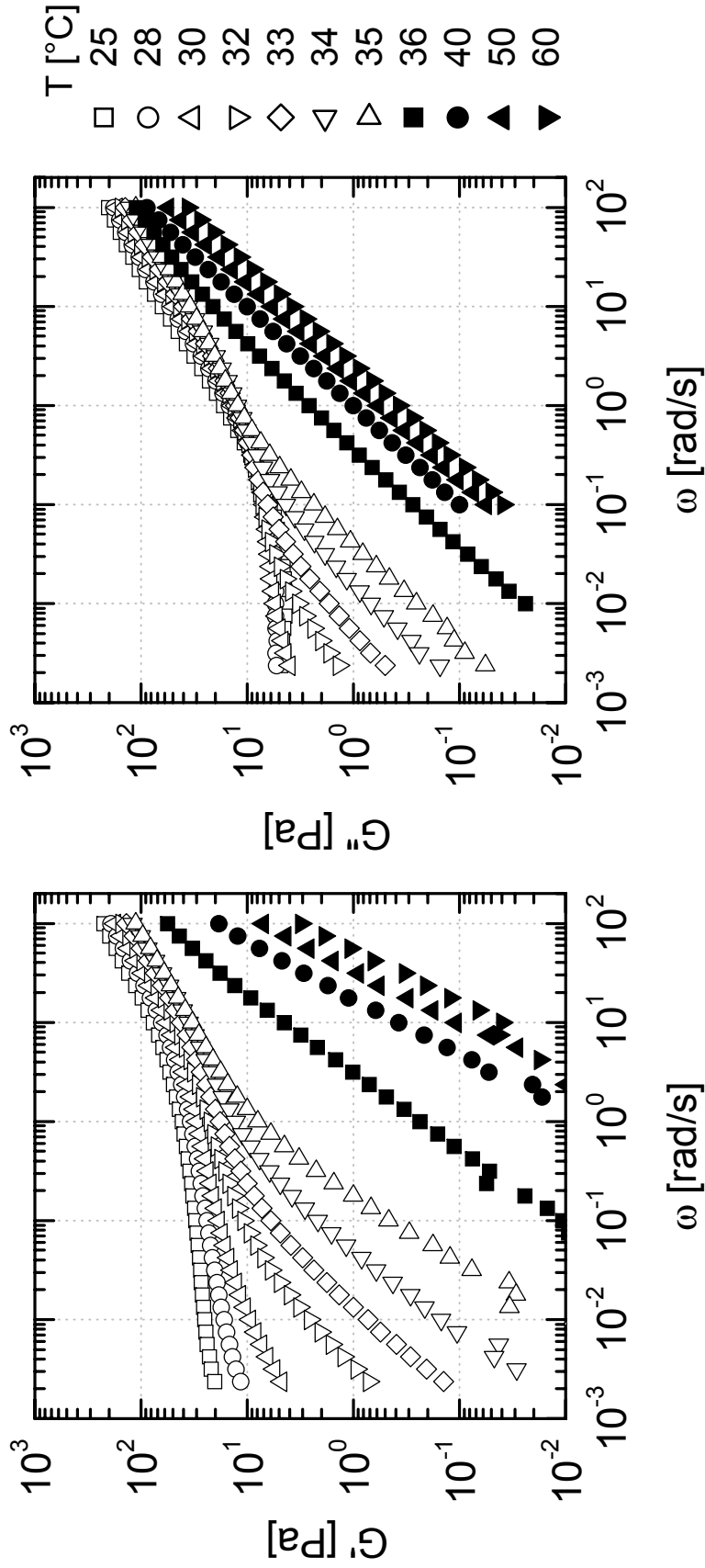


Figure E.23 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 950BdMMASiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

20% 950(70)BdMMASiCB4

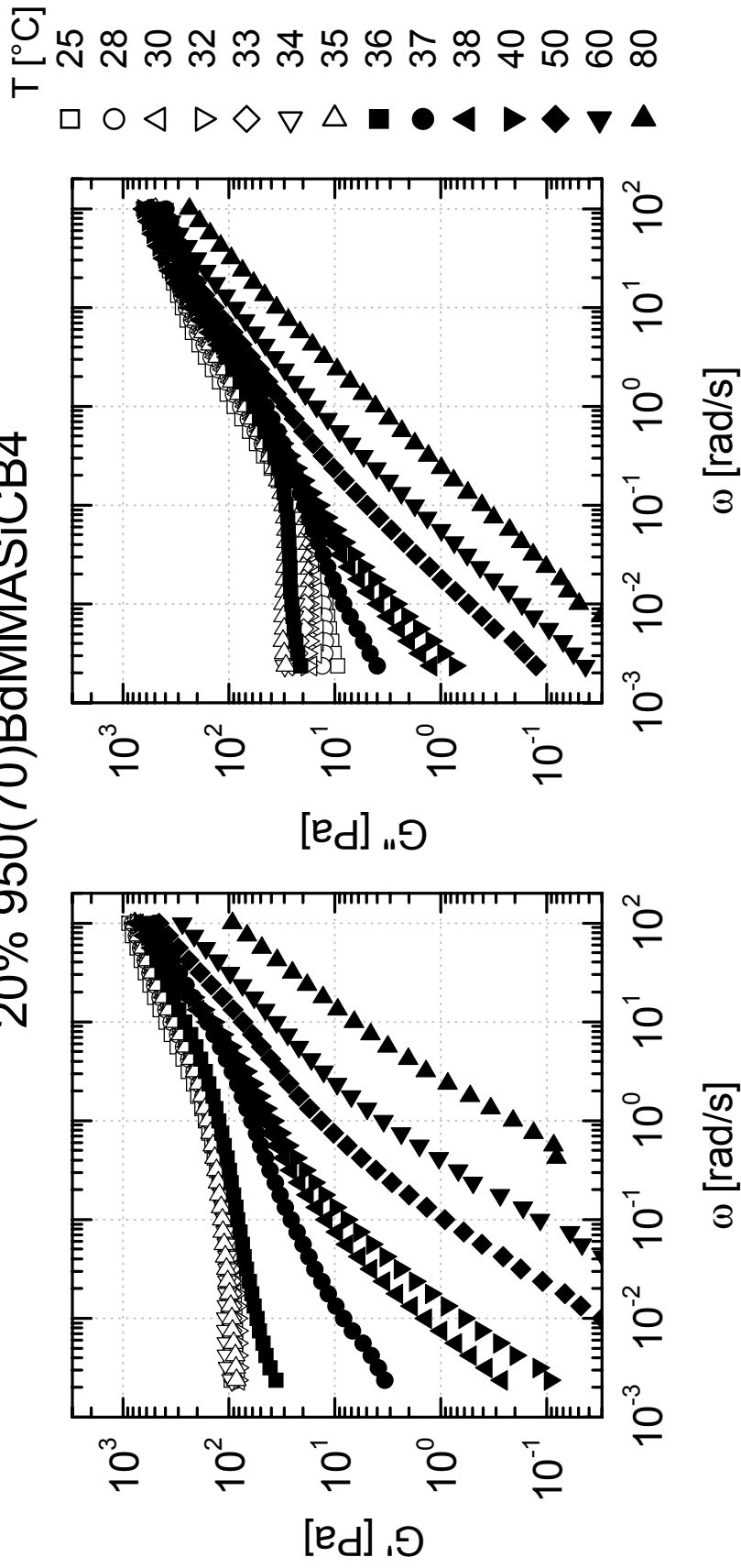


Figure E.24 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 20 wt % 950BdMMASiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

2% 1100ABASiCB4

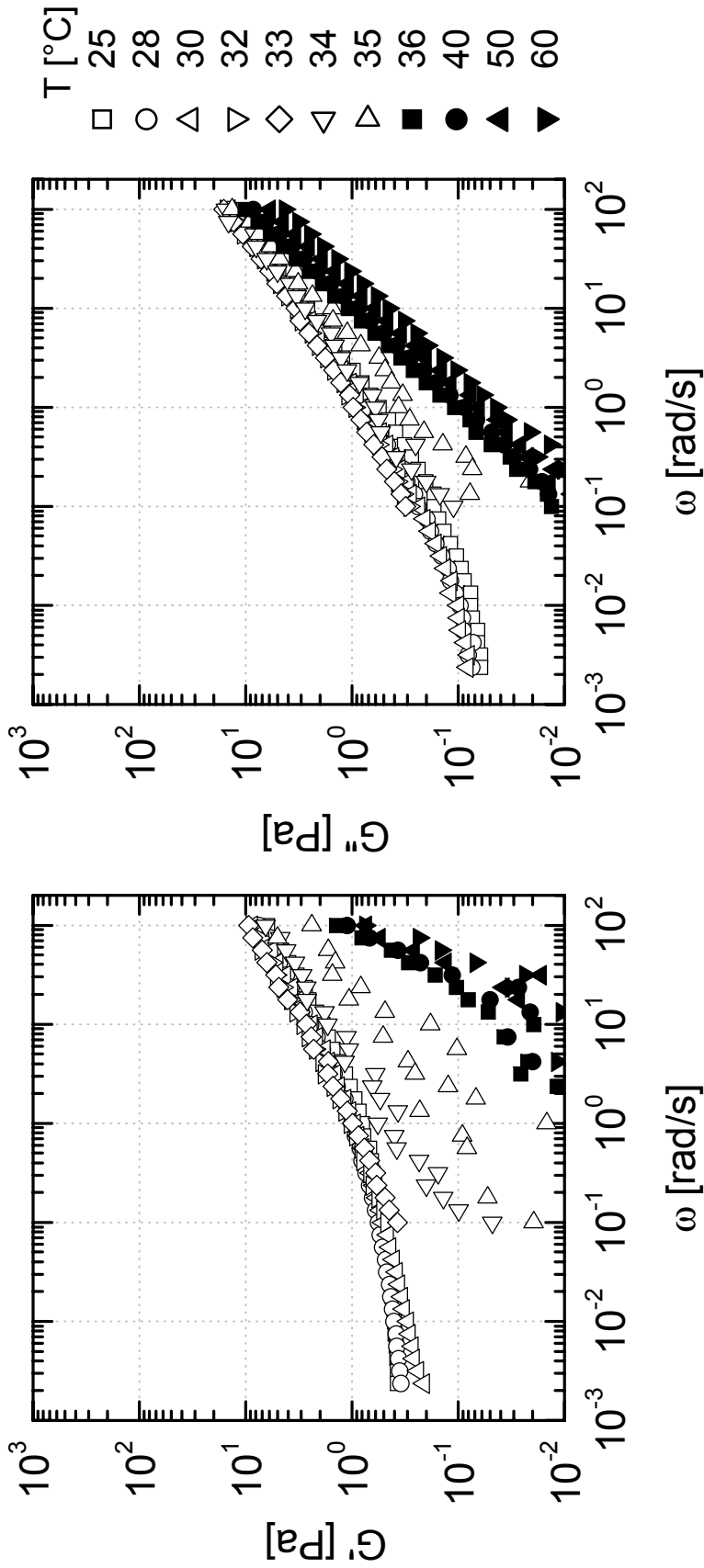


Figure E.25 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 1100ABASiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 1100ABASiCB4

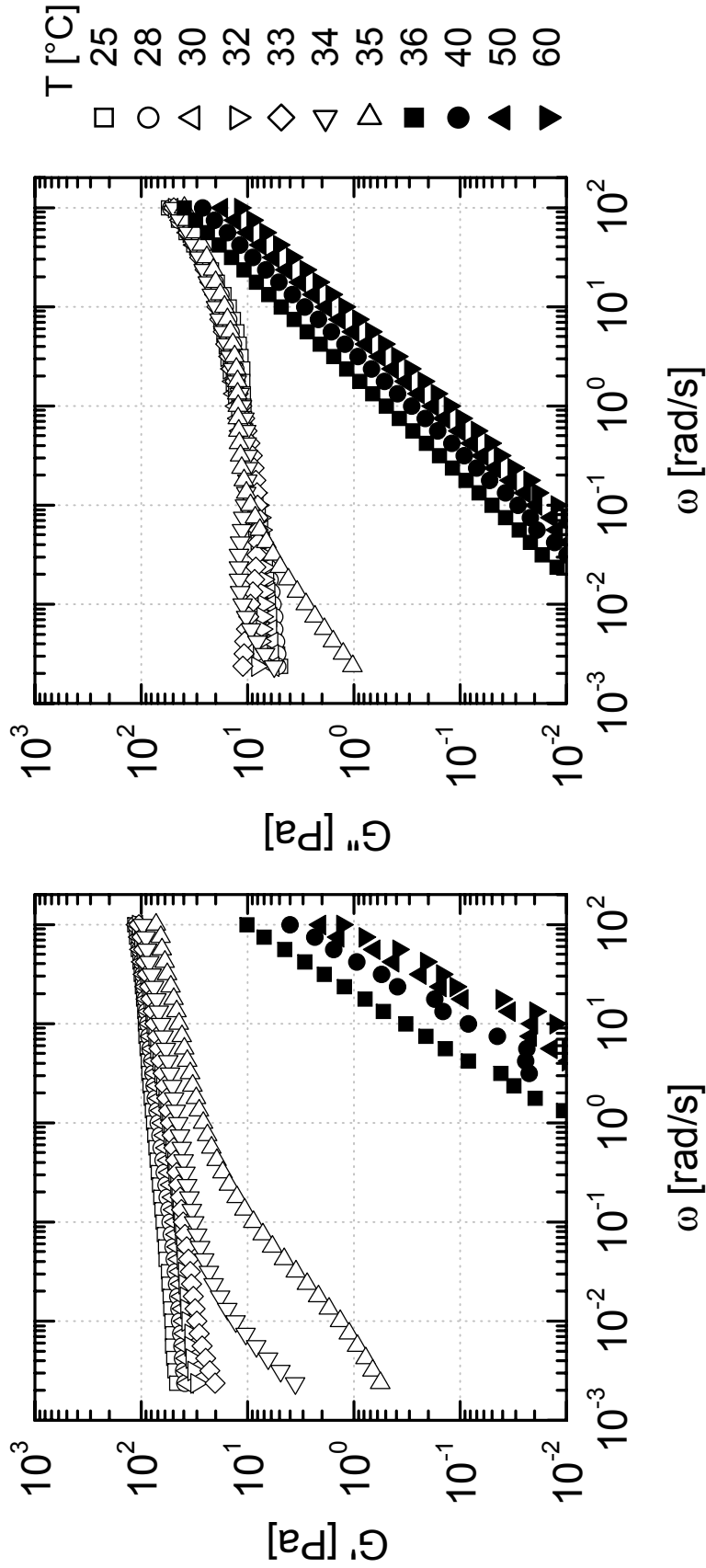


Figure E.26 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 1100ABASiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

2% 350HSiCB4

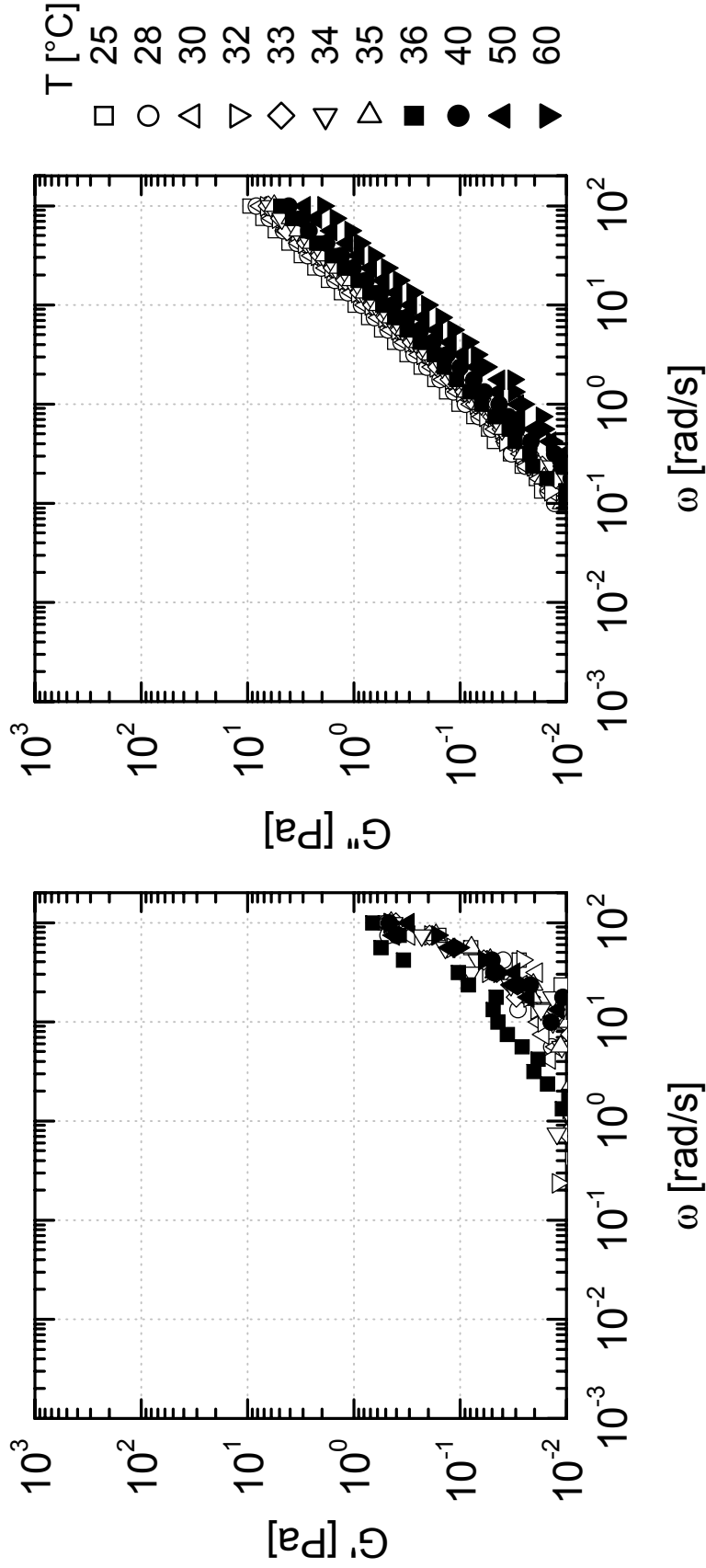


Figure E.27 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 350HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

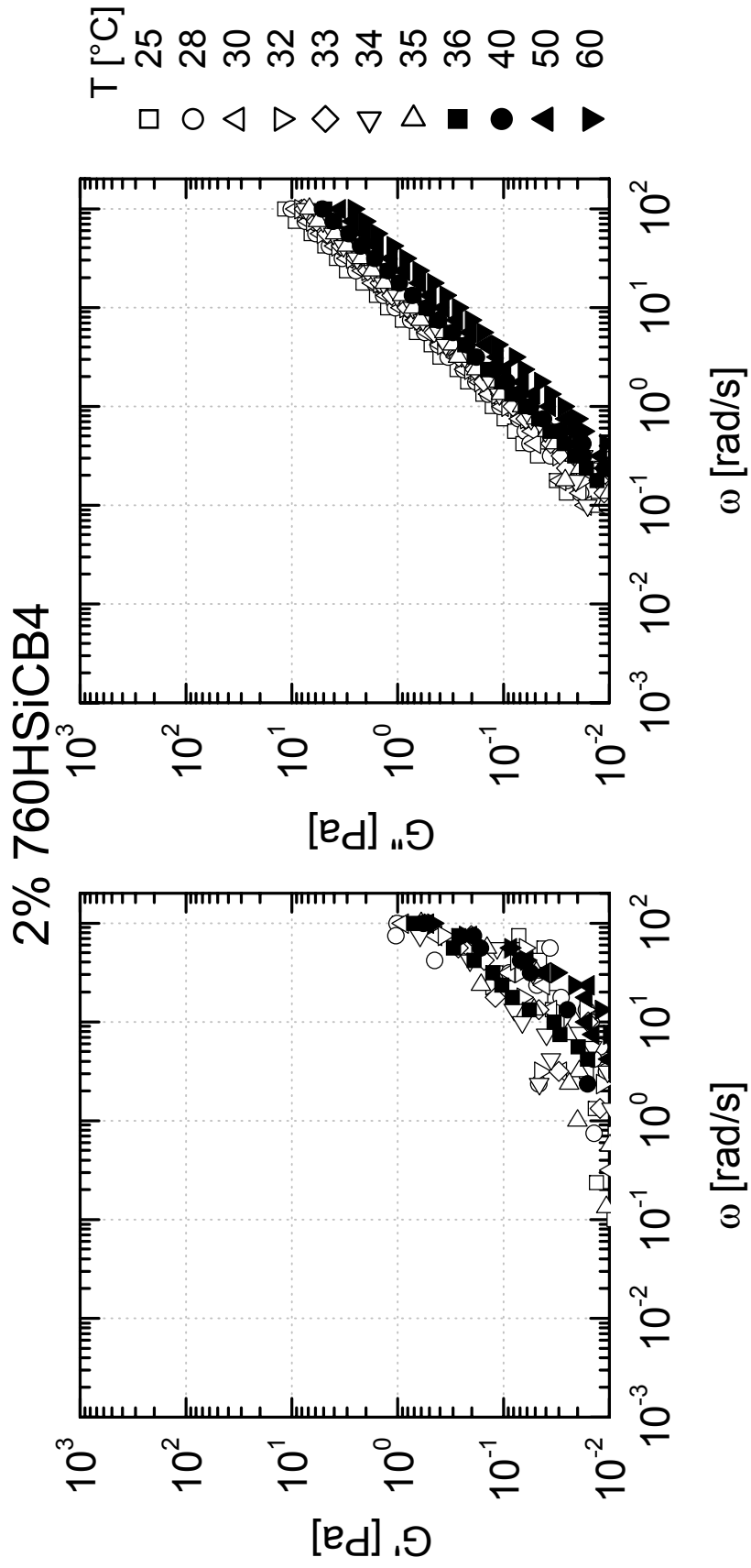


Figure E.28 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 2 wt % 760HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

5% 350HSiCB4

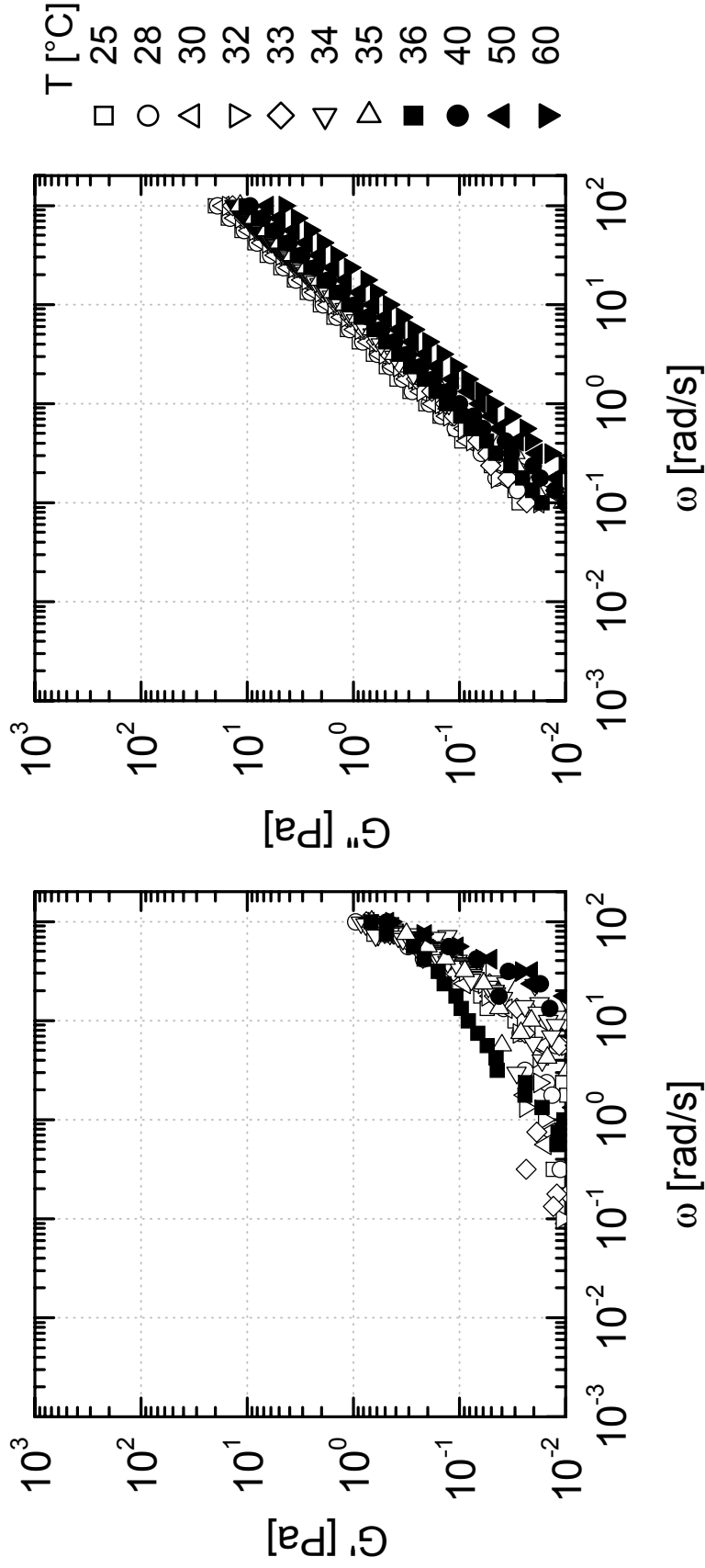


Figure E.29 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 350HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

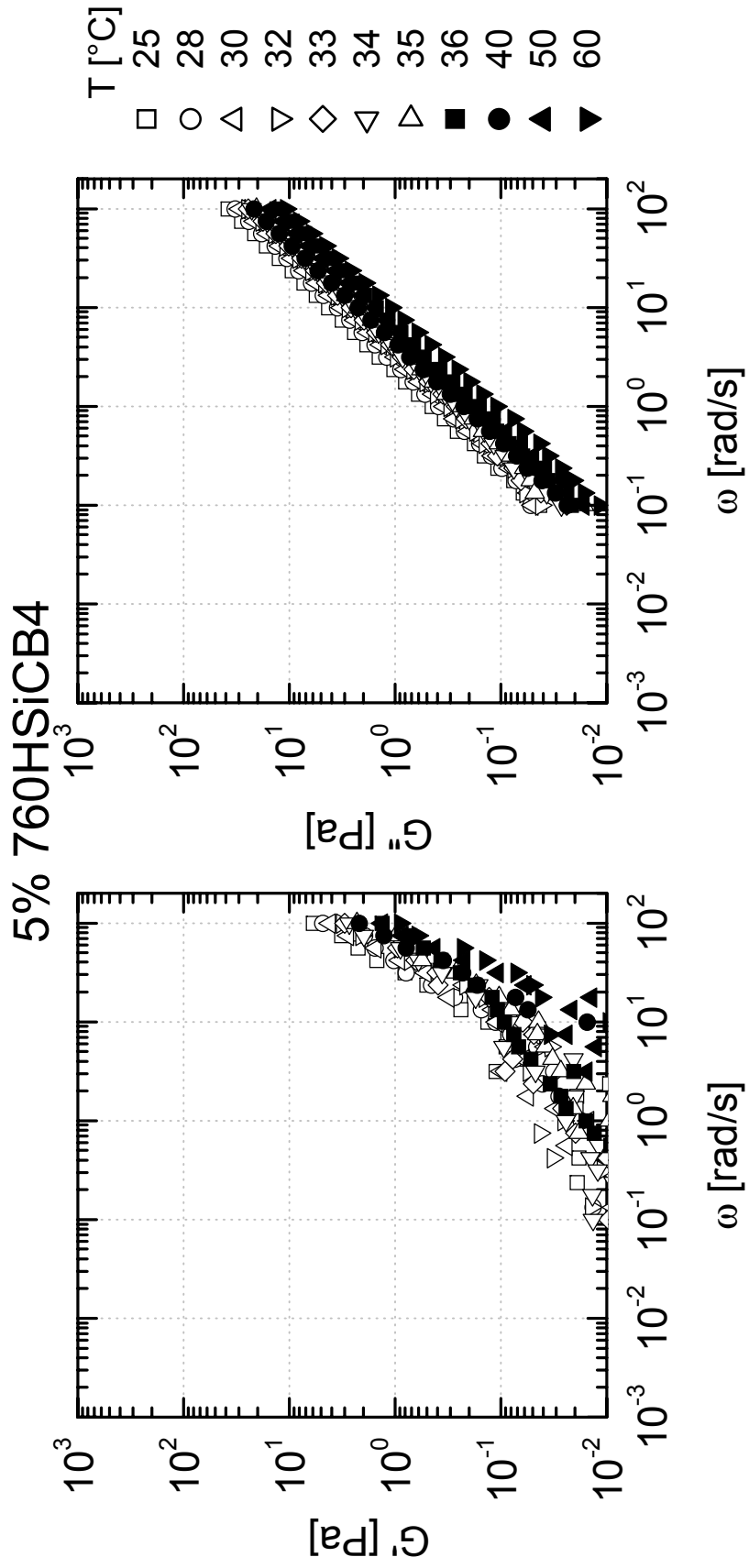


Figure E.30 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 5 wt % 760HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

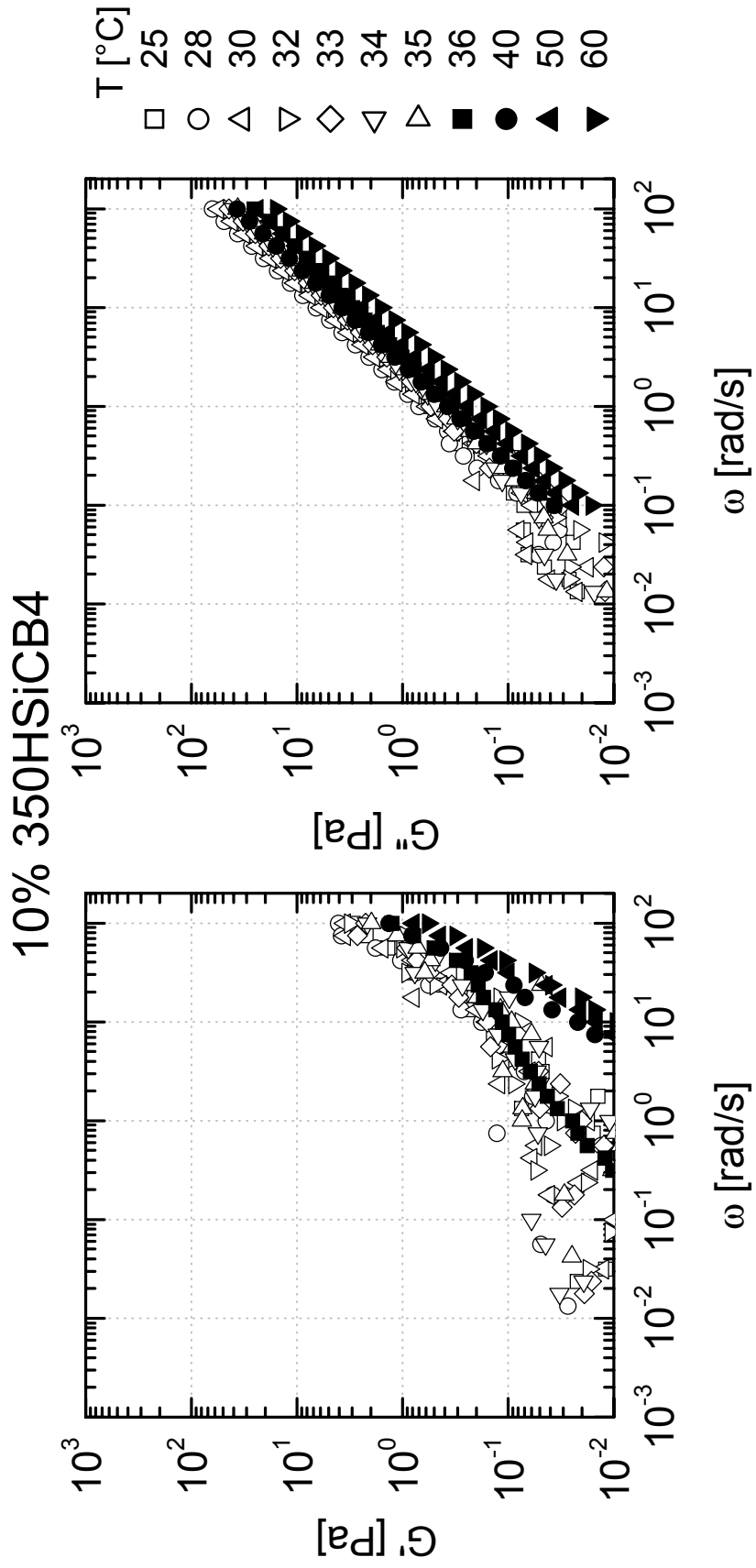


Figure E.31 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 350HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

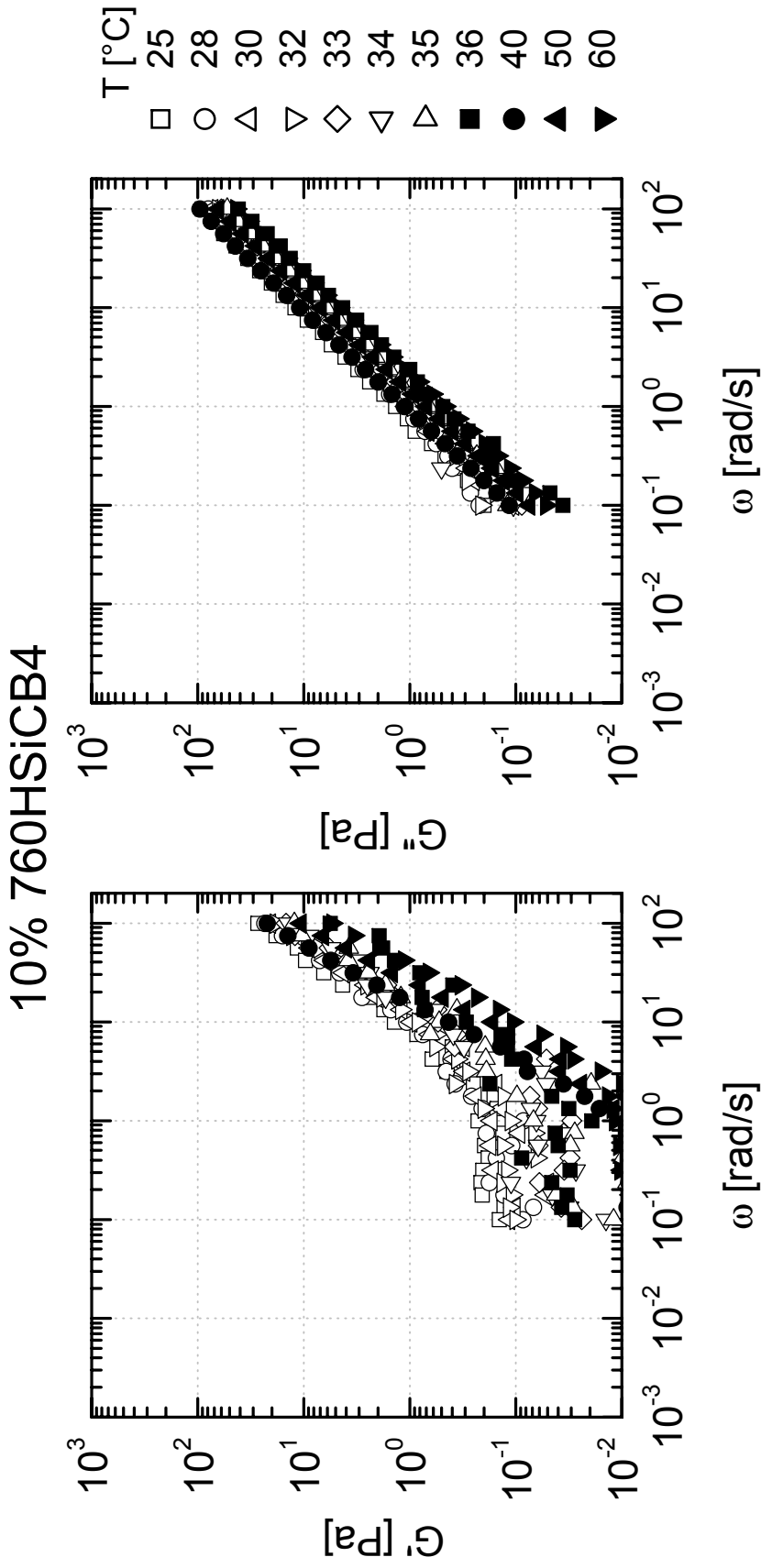


Figure E.32 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 10 wt % 760HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

20% 350HSiCB4

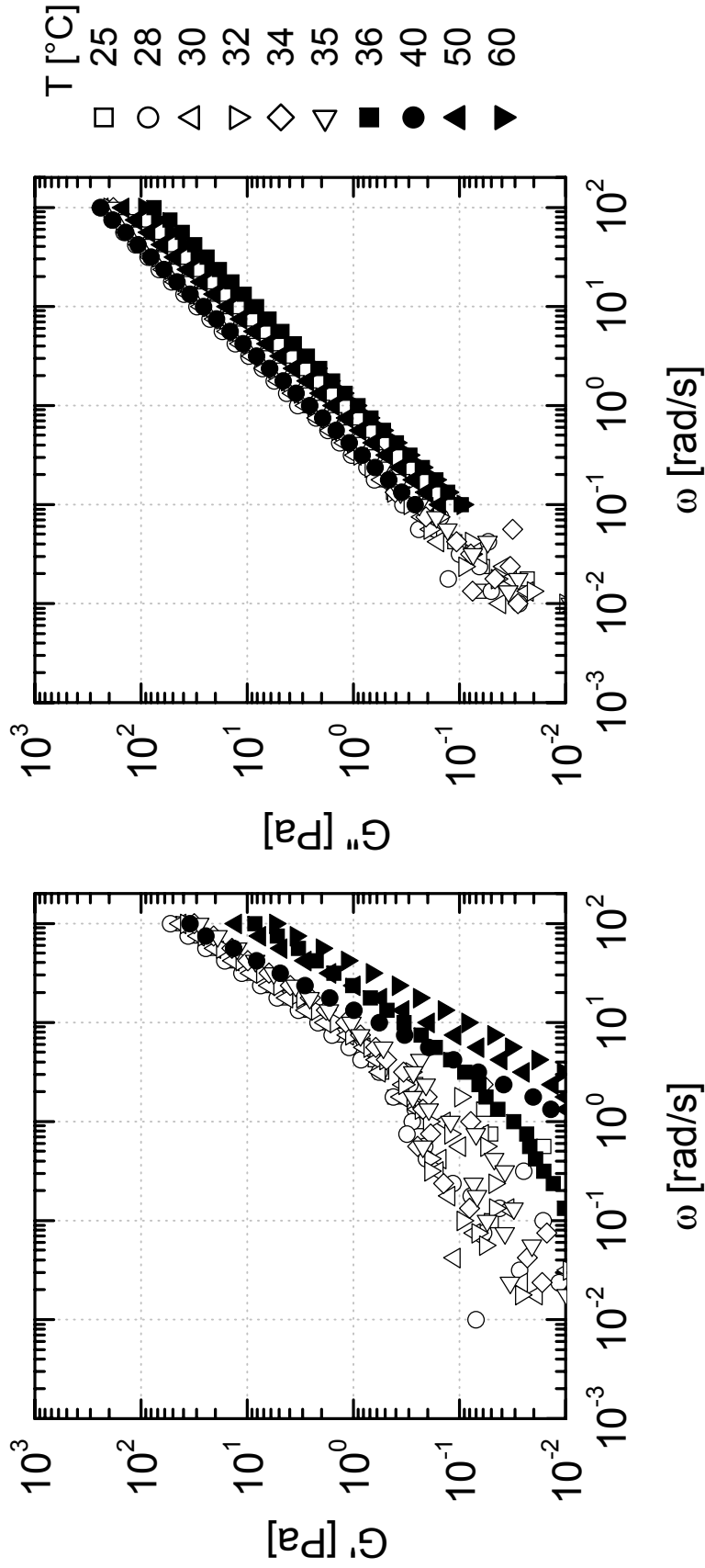


Figure E.33 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 20 wt % 350HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).

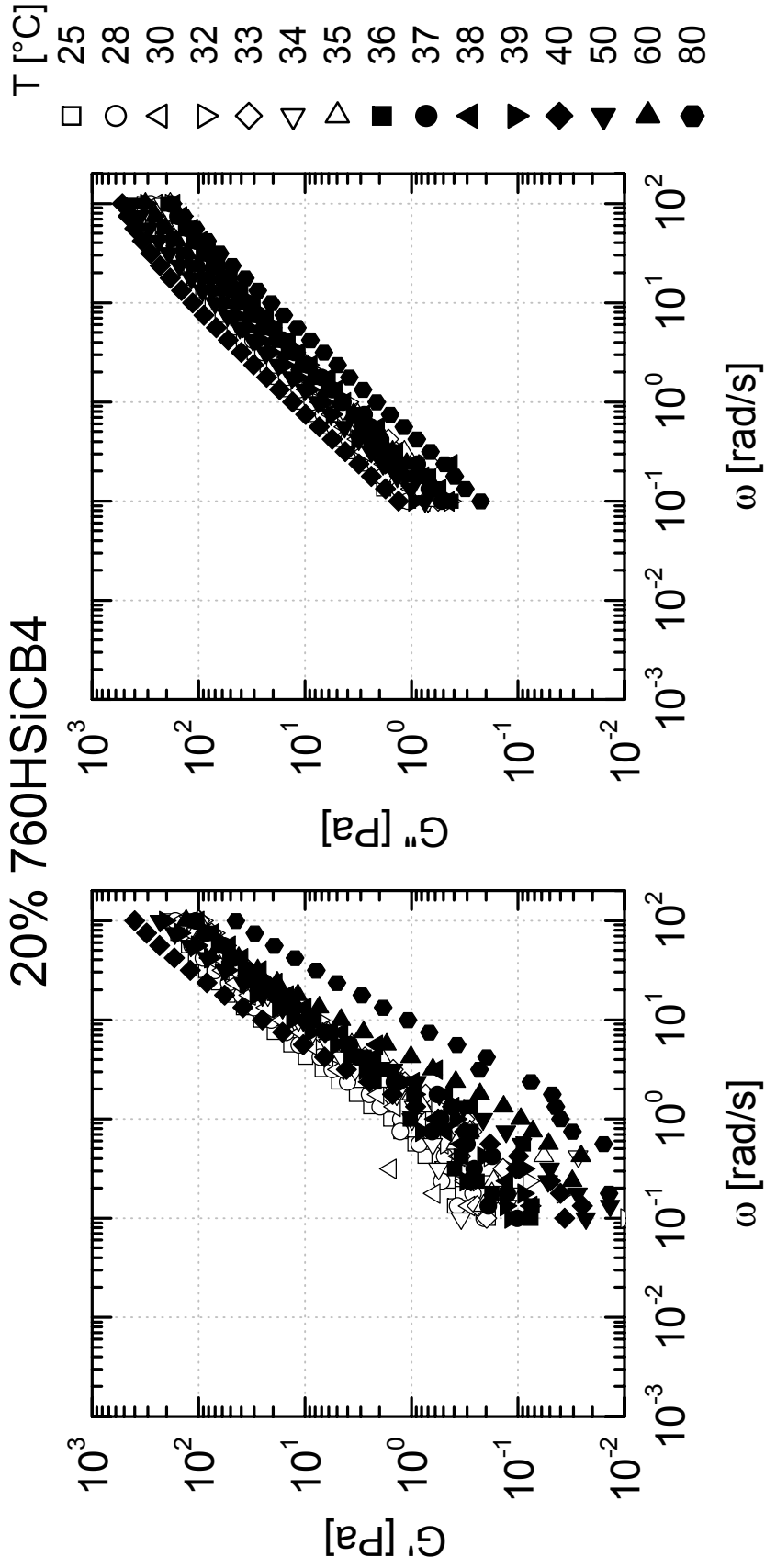


Figure E.34 Frequency (ω) dependence of the storage (G') and loss (G'') modulus of 20 wt % 760HSiCB4 in 5CB as a function of temperature (T) in the nematic phase (open symbols) and the isotropic phase (closed symbols).