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Compliance Effects of a Modern Rheometer STEPHEN HUTCHESON, GREGORY MCKENNA, Dept. of Chemical Eng./ Texas Tech University — Instrument compliance effects caused by both the transducer and entire instrument itself can induce large errors on shear measurements of viscoelastic properties of materials [1,2]. This effect can also lead to an error in estimating the relaxation time and shape parameter in the Kohlrausch-Williams-Watts (KWW) function [3]. We present examples of instrument compliance effects on the measurement of the material properties of small molecular glass formers and a commercially available polydimethylsiloxane (PDMS) rubber using a TA Instruments ARES Rheometer. The 2KFRT (Force Rebalanced Transducer) was replaced with a strain gage transducer (Honeywell-Sensotec). Stress relaxation and dynamic frequency sweep experiments were performed. We also present a technique to correct for compliance effects in stress relaxation experiments and dynamic frequency sweep experiments. Recommendations are made for both experimental and instrument design to avoid and/or minimize compliance effects. [1] M Gottlieb and C.W. Macosko, *Rheol. Acta* 1982 90-94. [2] M.E. Mackay and P.J. Halley, *J. Rheol.* 1991 1609-14. [3] R. Kohlrausch, *Poggendorf's Ann. Phys.* 91, 179 (1854).; G. Williams and D. C. Watts, *Trans. Faraday Soc.* 66, 80 (1970).

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