

shear rate characteristics of Magnetic Compound Fluid compound rate

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Key words : Magnetic Compound Fluid(MCF), Magnetic Fluid, Magneto-rheological Fluid(MRF), Shear rate, Shear stress

1. (Magnetic Fluid) MR (Magneto-rheological Fluid) MR (1,2) MR msec 10 MR MR (3-7) (Magnetic Fluid) Shimada MCF MR MR MR MR MR Lord Taiho 83.54 wt% MRF-240BS, 40 wt% W-40 MR 5 vol% MR +5 vol% MR, 85 vol% MR +20 vol% MR 20 mm, 2 mm, 150 mm 50 mm 0 T, 0.05 T, 0.1 T, 0.15 T

3. n MR

$$\tau = \frac{\mu}{2} \Delta \quad (1)$$

$$\dot{\gamma} = \frac{6}{b^2} \quad (2)$$

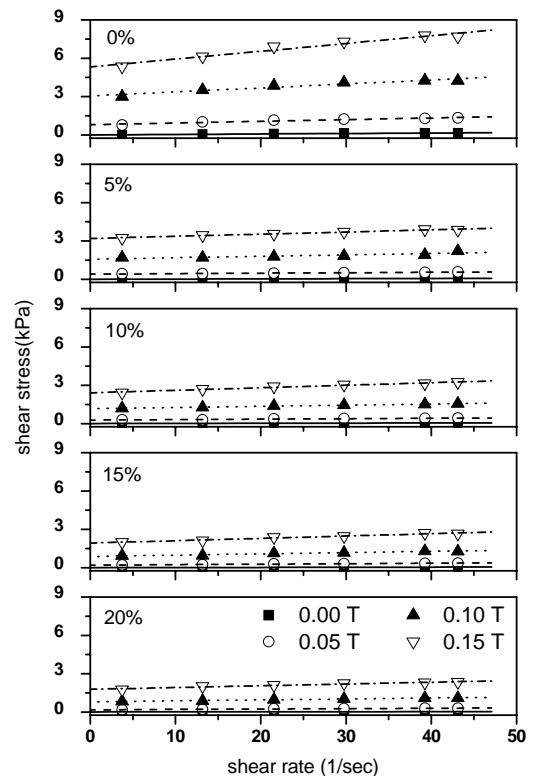


Fig. 1 Relation between shear stress and shear rate (measured and curve-fitted)

(1), (2) Fig. 1 0 0 5.5 kPa 3.35 kPa, 2.54 kPa, 2.06 kPa 1.91 kPa

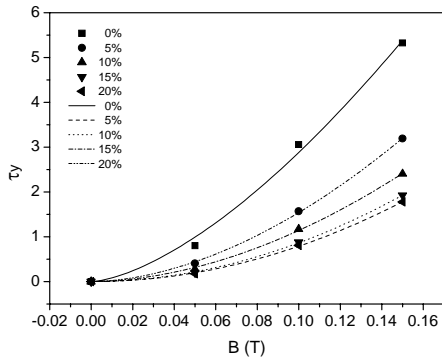


Fig. 2 The variations of yield stress relation to magnetic field (measured and curve-fitted)

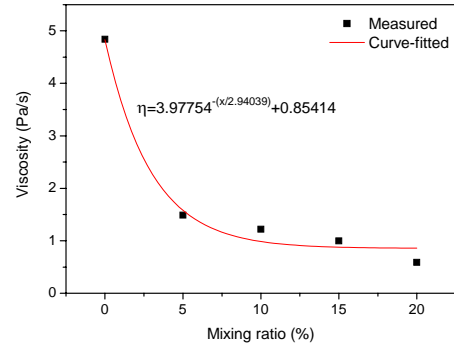


Fig. 4 Viscosity of Magnetic Compound Fluid (measured and curve-fitted)

Fig. 1

MR 0.15 T 5.5 kPa

kPa, 2.55 kPa, 2.06 kPa, 1.91 kPa

, 15 vol% 20 vol%

63.2%

rising time

Fig. 3

u

i

3.76 1/sec MR

= ,

113.186

55~70

MR 4.84 Pa/s , 5 vol%

1.49 Pa/s MR

30%

β 1.49 Pa/s, 1.22

Pa/s, 0.9966 Pa/s, 0.589 Pa/s

λ MR

MR 83.54%,

40%

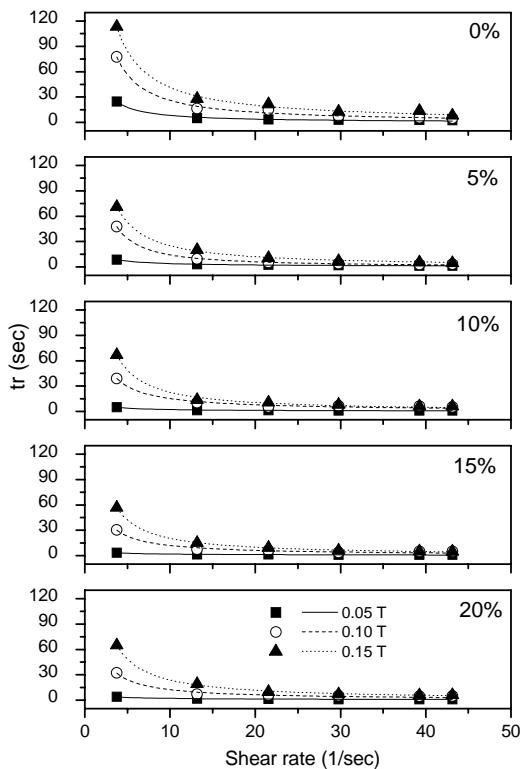


Fig. 3 Relation between response time and shear rate (measured and curve-fitted)

4.

1) MR

β

2) MR

MR

3) MR

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