

中国石油大学(北京)



, , 'R P D L Q H V G H) R U P D W L R Q

, Q J p Q L H U L H , Q W H O O L J H Q W H G X 3 p W U R L Q H H H W I G Q X J * D] , Q W H O O
, Q J p Q L H U L H , Q W H R Q Q W W I H R Q Q W H Q G W H H O O Q P S U O H Q W H U I S O R U D W L R Q (

, , , 0 R G H V G H) R U P D W L R Q H W ' X U p H G e W X G H

& H S U R J U D P P H R I I U H G H X [W \ S H V G H I R U P D W L R Q D Y H F G L I I p U H C

7 \ S H (Q V H L J Q p E D V p V X U O H V F R X U V / H S U R J U D P P H G H P D
V H P H V W U H V G D

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VXSHUULVHXU OHV pWXGLDQWV HQWUHSU@Q GLLQRQHVOQQ\$!USDMDW
LOV VRXPHWWURQW XQ UDSSRUW GH SUDW@XSHD H@W \$P@R@W@HF L@Q
OD SpULRGH G pWXGH SUHFULWH OHWp@XGS DQDWQ GXHL U@R@PSP
REWLHQHQW GHV UpVXOWDWV VDWLVIDLS/UDQDWLVT @B QG@H @H@R M
JOREDOH UHFHYURQW XQ FHUWLILFDW GH ILQ G@pWXGHV

7\SH 7KqVH EDVp VXU OD WKqVH /H SURJUQ@FGKG@HP@MWHU
PRLV DYHF XQH SpULRGH G pWXGH PD[L P D O H DC@Q Q P RIL V O\$IK @
pWXGLDQWV SDUWLFLSHURQW j XQ DSSUPHQWWLWHD GHDGXHWIRPPXQHV
GH SULQWHPSV ~ OD ILQ GH OD SUHPLqUHH@Q QH@QIF @A@G@VS@G@QD
GH IRUPDWLRQ SHXYHQW GHPDQGHU j EDVF@O@UDYQH@V@D@HL@QU R.



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VXUOD&X &KLQRLV	H &KLQRLVH &XOWXUH&KLQHVH &KLQRLVH&XOWXUH					VDW FRQGLWL FRUUHVS WHVVRQ pOLJLEOH GHPDQGH H[HPSWLR
	3K\VLTXH \$YDQFpH \$BYDQFHG 5pVHUYR3LHWURSK\VLFV 3pWUROLHUV			3ULQWHPSV<DQJ =KRX	\$XWRPQH+DL\DLQJ <X	
	0pFDQLTXH 3HWUROHXP GHV5RFKHV SRXU5HODWHG O, QJpQLHULH5RFN 3pWUROLqUH0HFKDQLFV				\$XWRPQH6KL\XDQ/L	
, QJpQ , QWHC H G &RX 2EOL RLUH 6SpF Wp)RUDJH\$GYDQFHG 3pWUROLHU:HOO QW\$YDQFpULOOLOQJ (QJLQHHULQJ				3ULQWHPSV'RQJ %LQJ+RX	
3pWUF GX*D	W,QJpQLHUQMHOOLJHQW ,QWHOOLJHQWHQH OD&RPSOSRMP\$RQHWLRQ GH3XLWQJLQHHULQJ			3ULQWHPSV4LQJKXR /LDR 0DR		6KHQJ
	,QJpQLHULH\$GYDQFHG \$YDQFpHGKV 5pVHUYRLUV5HVHUYRLU (QJLQHHULQJ 3pWUROLHUV			3ULQWHPSV;LX\X :DQJ		
	,QJpQLHULH,QWHOOLJHQW ,QWHOOLJHQWHQH OD3URGXFWLRQ3URGXFWLRQ (QJLQHHULQJ 3pWUROLqUH			3ULQWHPSV&RQJ ;LDR -LDQH 0RX		
, QJpQ , QWHC H G O ([SC LRQ	*pRORJL\$GYDQFHG QWBpWUROL3qHUMUROHXP \$YDQFpH*HRORJ\			\$XWRPQH5XLTLDQ &KHQ 3LQJSLQJ/L		
	3URFHV6XNGLPHQWDU\ 6pGLPHQW3ULRJHMVVHV			3ULQWHPSV=KL\DXQ *H		

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		HW % D V V L Q V G 6 p G L P H Q W D G U P M Q W D U \ % D V L Q V			
		* p R O R J L I W U X F W X U D O 6 W U X F W X * W D Q H R H W D Q G 7 H F W R Q L T X D W H G H V 3 O D T X H F W R Q L F V	Automne	= K L Q D / L X	
		, Q W H U S U p W D W L R Q 4 X D Q W L W D W L Y H G H V 6 p L V' P H V H W 3 U p Y L V L R Q V	4 X D Q W L W D W L Y H 6 H L V P L F Q W H U S U H W D W L R A utomne Q D Q G 3 U H G L F W L R Q	= R Q J K X / L D R	
		0 R G p O L V D I W P R Q L F D O 1 X P p U L T X H R G H O L Q J R Q O , Q J p Q L H H R M G H U P D O 6 W R F N D J H V H U Y R L U * p R W K H U R Q J K Q H H U E Q J	3 U L Q W H P S V + X D Q J	\leq R Q J K X L	
		& D U D F W p 5 H W D W U R R L U Q G H V & K D U D F W H U L I D 5 p V H U Y R L U W L R Q	3 U L Q W H P S D 4 L Q J / L	< X D Q] K H	

9, 2 U J D Q L V D W L R Q H W (I L J H Q F H V S R X U O H 3 U R M H)

/ H SURFHVXXV JOREDO GX SURMH W SUDWLTXQH GHXG HUXR MOHH W
6 p OHFWLRQ GX VXMHW 5HFKHUFKH 'p I H QQV IR U J&DQDLTVHHGRHUL H
HQVHLJQDQWV FRQFHUQpV SRXU SURSRVHD W LQTLXWL DIOWM PDIHQ W
UHVSQRQVDEOH GH O XQLYHUVLWp H[DPLQVH pOHX/GV\QMMWVH\W Q
HQVHLJQDQWV VRQW LPSOLTXpV GDQV X Q GSU RFEH\QVH\Q/VGH\JQDQW
SURSRVDQW OH VXMHW GRLW SUPFLVHU FLQIBIQUFHHP/HQXWSQJHR M R Q
SUDWLTXH DX PRPHQW GH OD IRUPXODWLRQ B X F R Q G M W L Q Q G R
QpFHVVDLUHV HW OHV SUPSDUDWLIV UHTXQWVS R K R LDIE F R P Q
OLEUHPHQW OHXU VXMHW HW DSUqV O VWS FURQEV D V B Q FGRXPQ HUXH
FKRL[GH VXMHW UpXVVL SRXU O pWXGLDQ3AR X(IQ GSU\Q/FXLMHHW V
QpFHVVLWDQW XQH FRODERUDWLRQ G W ISIORXILHAXLDVQSMH O M R/QX
GHYUDLHQW SDUWLF DQHLDQW DQHDFRSQFRHNSHMC BXQVOMHVFKXH E QDCTLXH
pWXGLDQW GRLW DFFRPSOLU GRLYHQW rWpUMHXFGQDQWQH B X QW B
UHFHYRLUXQH IRUPDWLRQ SUDWLTXH FRPSOqWH

/ H UDSSRUW GH SUDWLTXH DSUqV O D U H Y X Q D S O B I D Q V PHH QGARRLW
rWUH VRXPLV j GH X [H Q Q V H K L D J Q Q D R Q Q V H V S R Q R U W D Q W H L W Q D D Q S I U H Q V H Q Q V X

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SURMHWSUDWLTXHJOREDOVRQWRUJDQLHVSHVOHXQSUVHWLVGpMHP
OWWXGLDQWHVWLQVFULW&HFRPLWpGMHGWpIHQVHHVWFRPSP

/DQRWHJOREDOHSRXUOHSURMHWSUDWLTSHVWWRRPGSXRVP
SURMHWSUDWLTXHUHSUpVHQWHODQHRSWpVGHHQADHUHYXHVG
ODQRWHGHODGpIHQVHUHSUpVHQWH

9,,eYDOXDWLRLQj0LSDUFRXUV

/pYDOXDWLRLQjPLSKDHFRRXQURURMPHIQMWFOXIXLQdJYOHUPHLQWpVGH

9,,,7KqVH

/DWKqVHHVWH[FXWpHFHQWDOXQWJOOHPWQWWHQHG
PDVWHU

